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ARS-145

December 1997

National Potato Germplasm Evaluation and Enhancement Report, 1996

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Sixty-Seventh Annual Report
by Cooperators

United States
Department of
Agriculture

**Agricultural
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Service**

ARS-145

December 1997

National Potato Germplasm Evaluation and Enhancement Report, 1996

**Sixty-Seventh Annual Report
by Cooperators**

Edited by Kathleen G. Haynes

Vegetable Laboratory
Beltsville Agricultural Research Center
Agricultural Research Service
U.S. Department of Agriculture
Beltsville, MD 20705

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United States Department of Agriculture,
Beltsville Agricultural Research Center,
Beltsville, Maryland, and Presque Isle,
Maine

K.G. Haynes and K.O. DeLong

Objectives: The USDA potato breeding program at Beltsville has four main objectives: (1) to develop improved pest-resistant germplasm and varieties; (2) to develop improved germplasm and varieties for processing directly out of cold storage; (3) to enhance germplasm for specific characteristics relating to pest resistance, yield, environmental stress, human nutrition and consumer acceptance; and, (4) to develop statistical genetic models for some of the new breeding strategies.

Breeding: Hybridizations in the greenhouse at BARC in early 1996 were made among tetraploid *Tuberosum* and *Tuberosum* x 4x wild species clonal material possessing resistance to late blight, soft rot and scab; high quality; processing and fresh market potential; white, russet, red and purple skin; yellow flesh; and, adaptability to various ecological test zones. Four hundred thirty-nine tetraploid crosses were successful. Crosses among diploid *S. phureja*-*S. stenotomum* and haploid-species hybrids were made for yellow flesh, cold chipping ability, and resistance to soft rot. Two hundred fifty crosses were successful. Tetraploid x diploid crosses were made for high specific gravity and resistance to soft rot, late blight and scab. One hundred crosses were successful.

Processing Evaluations: Yield trials for round whites (Tables 1-5), russets (Table 6), and specialty market types (Table 7) were conducted at Echo Lake. These were planted in a randomized complete block design with four replications of 25 hills on

May 16, 1996. Plants were spaced 9 inches within the row for all trials except the russet trial, in which plants were spaced 12 inches within the row. At harvest tubers from each plot were graded, specific gravity was determined by the weight in air and weight in water method, and the ten largest tubers from each plot were cut to determine the presence of hollow heart. Tuber samples were stored at 40°F, 45°F, and 50°F. Tubers were processed out of 40°F, 45°F, and 50°F, and following a three week reconditioning period of 70°F from cold storage at 40°F during January and February for the round white and russet trials. Selections in the specialty market trial were processed out of 50°F on January 14, 1997. For each combination of storage temperature and processing date, five tubers per sample from each plot were processed (20 samples per clone).

Tuber samples from all yield trials except the russets were processed into potato chips by taking 1/16-inch slices from the cross section of each tuber. Slices were rinsed in water and placed on paper towels to remove excess moisture. Chips were then fried at 340°F in Primex vegetable shortening until bubbling ceased.

Among the most advanced round, white-skinned selections in the program B0178-34, B0564-8, B0564-9 and B0766-3 continue to show promise for the chipping industry, while B0856-4 looks promising as a fresh market type (Table 1). Among the 19 *S. tuberosum* x *S. phureja*-*S. stenotomum* hybrids (B1065 through B1070) evaluated (Tables 1-3), seven were saved based on appearance, and of these, only B1066-78 processed into acceptable chips in January following 50°F and 45°F storage, however, its yield was significantly lower than Atlantic. B1065-51 and B1066-73 warrant

further evaluation for fresh market. Among the newer selections in the program B1083-51, B1110-11 and B1283-2 have the favorable combinations of good yield, moderately high specific gravity and acceptable chip color following processing in January from 50°F and 45°F storage to warrant further evaluation for the chip market.

Among the specialty market selections in the program, B0852-7 and B0967-11 continue to be two very high yielding, purple-skinned clones. Growth cracks were a problem with B0852-7 this year, but not with B0967-11. B0811-13 still shows some promise as a red-skinned, yellow-flesh selection, however, the heavy netted skin remains cause for caution with this one. Spacing studies are necessary to determine if either B0985-1 or B1145-2 has potential for the "B" size, red-skinned market (Table 7).

Tuber samples from the russet yield trial were processed into french fries. A 3/8-inch diameter plug was cut from the cross section of each tuber, rinsed, dried, and fried at 365°F for five minutes.

Among the russet selections in the program, B9922-11 still shows a lot of promise for either fresh market or processing. B9922-11 outyielded Russet Burbank, fried lighter and had a higher specific gravity (Table 6).

BARC Table 1. Yield, tuber size distribution, and quality characteristics of round whites harvested 132 days after planting at Echo Lake in 1996.

Pedigree	% Stand ¹	Mkt CWT/A	%Mkt	% Tuber Size Distribution					SG ²	HH ³
				<1 7/8"	1 7/8"-2 1/4"	2 1/4"-3 1/4"	3 1/4"-4"	>4"		
Atlantic	100	387	93	6.6	35.7	48.4	9.3	0.0	91	2
B0178-34	100	364	94	6.4	24.4	56.0	13.2	0.0	92	4
B0564-8	100	340	92	8.2	50.0	41.9	0.0	0.0	86	0
B0564-9	100	379	94	4.3	27.8	57.4	9.1	1.4	83	2
B0585-5	99	328	98	1.9	13.8	58.0	26.3	0.0	-	3
B0717-1	99	376	91	8.8	47.7	43.4	0.0	0.0	-	0
B0766-3	99	343	94	5.6	29.3	53.7	11.4	0.0	87	4
B0856-4	100	409	89	4.1	16.2	46.5	26.2	7.0	75	1
B0972-10	100	367	96	4.1	32.2	63.2	0.5	0.0	-	0
B0984-3	100	337	93	6.1	33.4	54.2	5.5	0.8	74	0
B1016-3	100	379	96	4.4	15.6	60.4	19.7	0.0	-	1
B1027-6	99	340	92	7.5	44.3	48.1	0.0	0.0	-	1
B1029-6	100	293	92	7.6	32.9	53.9	5.6	0.0	-	0
B1065-51	99	341	95	5.1	40.4	53.6	0.9	0.0	75	0
B1065-64	99	286	84	15.8	52.7	31.5	0.0	0.0	79	2
B1065-65	99	313	92	7.5	42.2	50.3	0.0	0.0	-	0
Monona	98	294	94	5.6	22.8	59.6	12.0	0.0	67	0
Snowden	100	238	78	22.2	53.3	24.5	0.0	0.0	90	0
LSD (.05)		62								

¹ % Stand on July 1, 1996

² 1.0 omitted

³ Number of tubers with hollow heart out of 40.

BARC Table 1. Continued

Pedigree	Shape ⁴	Eye Depth ⁵	Sgr ⁶	GC ⁷	SS ⁸	HS ⁹	GR ¹⁰	SB ¹¹	Harvest
Atlantic	2	3	9	9	5	9	9	9	
B0178-34	2	5	9	7	5	9	9	9	
B0564-8	2	3	9	9	5	9	9	7	
B0564-9	2	5	9	9	5	9	9	9	
B0585-5	2	5	9	7	5	9	9	9	Discard
B0717-1	2	5	9	9	5	9	9	9	Discard
B0766-3	2	5	9	7	5	9	9	9	
B0856-4	2	3	9	5	5	9	9	9	
B0972-10	5	7	9	9	5	9	7	9	Discard
B0984-3	5	7	9	9	5	9	9	9	
B1016-3	5	5	7	7	5	9	9	9	Discard
B1027-6	5	7	9	9	5	9	9	9	Discard
B1029-6	5	5	9	9	5	9	7	9	Discard
B1065-51	2	5	7	7	5	9	9	9	
B1065-64	5	5	9	9	5	9	7	9	
B1065-65	5	7	7	7	5	9	7	9	Discard
Monona	5	5	9	9	5	9	9	9	
Snowden	2	5	9	9	5	9	9	9	

⁴Tuber shape: NE-107 rating scale

⁵Eye depth: “

⁶Second growth: “

⁷Growth cracks: “

⁸Silver scurf: “

⁹Heat sprouts: “

¹⁰Greening: “

¹¹Scab: “

BARC Table 1. Continued

Temperature Date	50°F 1/13	45°F 1/14	40°F 1/15	40°-70°F 1/6	50°F 2/4	45°F 2/5	40°F 2/7	40°-70°F 2/3
Pedigree	Chip ¹²	Spt ¹³	Chip	Spt	Chip	Spt	Chip	Spt
Atlantic	6.5	M	6.0	M	9.1	O	6.9	M
B0178-34	6.5	M	5.3	M	8.7	O	6.4	S
B0564-8	6.6	L	6.8	M	9.0	O	7.7	S
B0564-9	6.8	M	6.5	S	9.1	O	7.8	S
B0585-5	-	-	-	-	-	-	-	-
B0717-1	-	-	-	-	-	-	-	-
B0766-3	5.8	L	5.8	M	8.5	O	5.8	M
B0856-4	7.2	VL	7.1	VL	10.0	O	8.6	S
B0972-10	-	-	-	-	-	-	-	-
B0984-3	8.0	M	8.0	S	10.0	O	9.2	S
B1016-3	-	-	-	-	-	-	-	-
B1027-6	-	-	-	-	-	-	-	-
B1029-6	-	-	-	-	-	-	-	-
B1065-51	8.3	L	8.1	M	10.0	O	8.8	S
B1065-64	7.8	VL	7.4	L	10.0	O	8.8	M
B1065-65	-	-	-	-	-	-	-	-
Monona	6.3	M	6.0	M	9.0	O	6.5	S
Snowden	6.3	M	6.0	S	9.1	O	6.3	S

¹²Chips 1-7 = satisfactory

¹³Sprout length: 0 = no sprouts, S < 0.5", M 0.5-1.5", L 1.5-2.5", VL > 2.5"

BARC Table 2.

Yield, tuber size distribution, and quality characteristics of round whites harvested 132 days after planting at Echo Lake in 1996.

Pedigree	% Stand ¹	Mkt CWT/A	%Mkt	% Tuber Size Distribution					SG ²	HH ³
				<1 7/8"	1 7/8-2 1/4"	2 1/4-3 1/4"	3 1/4-4"	>4"		
Atlantic	100	381	90	8.6	39.5	46.4	4.5	1.0	85	2
B1065-79	100	229	88	12.0	57.0	31.0	0.0	0.0	-	1
B1066-21	99	309	91	9.3	38.3	52.0	0.5	0.0	-	0
B1066-23	100	358	93	6.5	29.5	57.6	6.3	0.0	-	3
B1066-37	99	256	90	10.0	54.3	35.7	0.0	0.0	76	1
B1066-51	99	370	94	5.5	28.3	55.2	10.9	0.0	86	0
B1066-73	100	345	94	5.0	22.5	56.8	14.9	0.7	81	1
B1066-78	100	233	95	5.2	38.6	52.7	3.5	0.0	77	0
B1066-97	100	359	95	5.2	25.8	66.4	2.6	0.0	-	0
B1067-11	100	386	96	3.1	15.8	61.1	19.3	0.7	-	1
B1067-16	98	294	93	6.9	40.3	51.6	1.2	0.0	-	0
B1067-23	100	274	94	6.5	34.4	53.3	5.8	0.0	-	0
B1067-25	100	192	88	11.7	56.9	31.4	0.0	0.0	-	0
B1068-15	100	294	90	10.5	38.9	47.1	3.5	0.0	-	0
B1068-49	100	407	90	9.7	39.2	44.2	6.2	0.7	-	0
B1069-10	100	425	94	6.4	33.2	55.0	5.4	0.0	-	0
Norchip	100	277	82	18.1	58.3	23.6	0.0	0.0	73	0
Snowden	100	306	87	12.9	47.5	39.3	0.3	0.0	87	0
LSD (.05)			43							

1-13 See Table 1

BARC Table 2. Continued

Pedigree	Shape ⁴	Eye Depth ⁵	Sgr ⁶	GC ⁷	SS ⁸	HS ⁹	GR ¹⁰	SB ¹¹	Harvest
Atlantic	2	5	5	9	5	9	9	9	
B1065-79	8	7	9	7	7	9	9	9	Discard
B1066-21	5	5	7	9	5	9	9	9	Discard
B1066-23	2	5	9	5	5	9	5	9	Discard
B1066-37	3	5	7	7	5	9	9	9	
B1066-51	2	5	9	3	7	9	9	9	
B1066-73	5	5	9	5	5	9	9	9	
B1066-78	6	5	7	7	5	9	7	9	
B1066-97	5	5	9	5	5	9	9	9	Discard
B1067-11	2	3	5	9	7	9	7	9	Discard
B1067-16	5	3	5	9	5	9	9	9	Discard
B1067-23	2	3	7	9	8	9	5	9	Discard
B1067-25	3	7	7	9	5	9	9	9	Discard
B1068-15	2	3	9	3	5	9	9	9	Discard
B1068-49	3	7	5	9	5	9	9	9	Discard
B1069-10	2	3	7	7	5	9	9	9	Discard
Norchip	2	5	7	7	5	9	9	9	
Snowden	2	3	9	9	5	9	9	9	

BARC Table 2. Continued

Temperature	50°F	45°F	40°F	40°-70°F	50°F	45°F	40°F	40°-70°F
Date	1/13	1/15	1/15	1/6	2/5	2/6	2/7	2/3
Pedigree	Chip ¹² Spt ¹³	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt
Atlantic	7.2 M	7.0 M	9.5 O	6.6 M	7.3 VL	6.9 L	9.1 O	6.9 L
B1065-79	-	-	-	-	-	-	-	-
B1066-21	-	-	-	-	-	-	-	-
B1066-23	-	-	-	-	-	-	-	-
B1066-37	7.1 VL	6.8 VL	9.3 O	7.9 S	7.6 VL	6.8 VL	8.5 O	8.0 M
B1066-51	8.3 VL	7.9 VL	10.0 O	8.9 S	7.8 VL	8.3 VL	9.4 O	8.0 L
B1066-73	7.8 M	7.7 M	9.9 O	8.9 S	7.8 VL	7.6 L	9.6 O	8.8 S
B1066-78	6.8 S	6.9 S	9.4 O	8.2 S	7.3 M	6.8 M	8.8 O	8.5 S
B1066-97	-	-	-	-	-	-	-	-
B1067-11	-	-	-	-	-	-	-	-
B1067-16	-	-	-	-	-	-	-	-
B1067-23	-	-	-	-	-	-	-	-
B1067-25	-	-	-	-	-	-	-	-
B1068-15	-	-	-	-	-	-	-	-
B1068-49	-	-	-	-	-	-	-	-
B1069-10	-	-	-	-	-	-	-	-
Norchip	7.4 L	7.3 M	10.0 O	7.5 S	7.5 L	7.3 M	9.3 O	8.1 M
Snowden	7.3 M	6.0 M	9.0 O	6.3 S	6.5 L	6.0 L	8.1 O	6.0 M

BARC Table 3. Yield, tuber size distribution, and quality characteristics of round whites harvested 132 days after planting at Echo Lake in 1996.

Pedigree	% Stand ¹	Mkt CWT/A	%Mkt	% Tuber Size Distribution					SG ²	HH ³
				<17/8"	17/8-2 1/4"	2 1/4-3 1/4"	3 1/4-4"	>4"		
Atlantic	100	409	93	6.6	38.4	48.3	6.7	0.0	96	1
B1070-88	99	268	78	21.6	51.2	27.2	0.0	0.0	93	0
B1071-20	100	374	93	7.1	42.8	48.6	1.4	0.0	-	0
B1072-21	100	372	95	3.2	15.7	63.1	16.4	1.6	74	1
B1075-26	100	279	94	6.3	43.1	49.6	1.0	0.0	85	0
B1081-4	100	360	96	3.9	37.6	58.5	0.0	0.0	-	0
B1083-51	98	369	97	2.9	20.8	64.5	11.8	0.0	89	1
B1088-37	100	455	95	3.8	19.5	65.0	10.6	1.1	73	1
B1090-19	98	308	92	6.5	24.6	61.1	6.7	1.2	-	0
B1091-29	100	352	90	10.5	37.8	48.6	3.1	0.0	86	0
B1093-21	100	337	93	7.1	28.4	59.4	5.1	0.0	-	0
B1093-46	99	337	94	5.6	18.0	57.5	18.9	0.0	-	1
B1098-30	100	287	93	6.7	39.4	53.2	0.8	0.0	-	0
B1098-32	99	342	95	5.2	30.5	56.9	7.4	0.0	-	3
B1110-11	100	364	89	9.8	35.7	45.5	8.2	0.8	86	1
B1150-5	99	362	94	5.8	39.7	47.1	7.4	0.0	-	0
BelChip	100	393	94	5.2	26.1	53.9	14.1	0.7	82	0
MaineChip	100	365	95	5.0	39.9	52.8	2.3	0.0	93	0
LSD (.05)			57							

¹⁻¹³ See Table 1

BARC Table 3. Continued

Pedigree	Shape ⁴	Eye Depth ⁵	Sgr ⁶	GC ⁷	SS ⁸	HS ⁹	GR ¹⁰	SB ¹¹	Harvest
Atlantic	2	5	9	9	5	9	9	9	
B1070-88	8	5	9	9	5	9	9	8	
B1071-20	8	5	9	3	5	9	9	9	Discard
B1072-21	5	5	9	9	5	9	9	2	
B1075-26	5	5	9	9	5	9	9	9	
B1081-4	5	7	9	9	7	9	9	9	Discard
B1083-51	3	5	9	9	5	9	9	7	
B1088-37	2	5	9	9	5	9	7	9	
B1090-19	5	7	9	5	7	9	9	7	
B1091-29	2	5	9	9	5	9	9	9	
B1093-21	2	7	9	9	8	9	9	5	Discard
B1093-46	3	7	9	7	7	9	9	9	Discard
B1098-30	5	5	9	7	5	9	9	7	Discard
B1098-32	2	5	9	9	5	9	7	5	Discard
B1110-11	2	5	9	9	5	9	9	9	
B1150-5	2	7	9	9	5	9	9	9	Discard
BelChip	5	5	7	7	5	9	7	9	
MaineChip	5	7	9	7	5	9	9	9	

BARC Table 3. Continued

Temperature	50°F	45°F	40°F	40°-70°F	50°F	45°F	40°F	40°-70°F	40°F	40°-70°F
Date	1/14	1/15	1/16	1/6	2/5	2/7	2/7	2/3	2/7	2/3
Pedigree	Chip ¹²	Spt ¹³	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt
Atlantic	6.6	M	6.3	M	9.3	O	7.5	M	6.6	VL
B1070-88	7.8	VL	8.0	VL	10.0	S	8.7	L	7.9	VL
B1071-20	-	-	-	-	-	-	-	-	-	-
B1072-21	7.6	S	7.9	S	10.0	O	8.7	S	7.7	M
B1075-26	7.6	S	7.0	S	9.9	O	8.3	S	6.6	M
B1081-4	-	-	-	-	-	-	-	-	-	-
B1083-51	6.5	O	6.9	S	9.6	O	8.1	S	6.9	M
B1088-37	8.0	L	7.8	L	10.0	O	8.4	M	8.0	VL
B1090-19	-	-	-	-	-	-	-	-	-	-
B1091-29	8.0	VL	8.0	VL	10.0	S	8.8	M	7.9	VL
B1093-21	-	-	-	-	-	-	-	-	-	-
B1093-46	-	-	-	-	-	-	-	-	-	-
B1098-30	-	-	-	-	-	-	-	-	-	-
B1098-32	-	-	-	-	-	-	-	-	-	-
B1110-11	7.1	S	6.3	S	9.5	O	7.9	S	7.1	L
B1150-5	-	-	-	-	-	-	-	-	-	-
BelChip	6.3	M	6.3	M	9.4	O	7.7	S	6.9	VL
Maine-Chip	5.5	M	5.0	L	8.3	O	7.0	S	6.8	VL
									8.0	O
									6.5	S

BARC Table 4. Yield, tuber size distribution, and quality characteristics of round whites harvested 132 days after planting at Echo Lake in 1996.

Pedigree	% Stand ¹	Mkt CWT/A	%Mkt	% Tuber Size Distribution					SG ²	HH ³
				<17/8"	17/8-2 1/4"	2 1/4-3 1/4"	3 1/4-4"	>4"		
Abnaki	100	342	95	4.6	25.2	60.7	9.4	0.0	77	0
Atlantic	99	402	92	7.6	39.8	45.9	6.7	0.0	93	0
B1157-5	100	259	82	17.9	50.4	31.7	0.0	0.0	78	0
B1206-10	99	339	94	4.2	24.8	57.9	10.9	2.2	73	2
B1208-24	100	343	92	8.4	46.8	44.8	0.0	0.0	-	5
B1210-1	99	404	90	5.9	24.0	49.2	16.4	4.5	-	9
B1210-11	100	336	84	7.4	30.5	46.0	7.0	9.0	-	4
B1210-6	99	308	90	10.3	33.5	52.1	4.1	0.0	-	3
B1213-7	100	383	96	4.3	29.2	57.4	9.1	0.0	74	1
B1214-4	99	367	95	4.7	26.7	63.4	5.1	0.0	-	0
B1214-7	100	375	86	2.6	11.3	45.3	29.3	11.5	81	0
B1216-3	100	396	90	10.3	45.7	43.0	1.0	0.0	-	0
B1236-3	100	416	96	4.1	21.8	60.6	13.4	0.0	-	0
B1239-3	100	269	92	8.0	29.7	58.8	3.4	0.0	-	3
B1240-1	100	335	94	3.5	18.9	61.0	13.8	2.9	82	0
B1240-12	100	309	92	6.1	24.5	56.9	10.9	1.6	86	0
B1240-14	100	369	91	9.2	38.5	46.0	6.4	0.0	89	5
Suncrisp	100	384	93	5.5	24.8	60.7	7.9	1.1	95	1
LSD (.05)		42								

¹⁻¹³ See Table 1

BARC Table 4. Continued

Pedigree	Shape ⁴	Eye Depth ⁵	Sgr ⁶	GC ⁷	SS ⁸	HS ⁹	GR ¹⁰	SB ¹¹	Harvest
Abnaki	2	5	7	9	5	9	9	9	
Atlantic	2	5	9	9	5	9	9	9	
B1157-5	7	7	9	7	5	9	7	9	
B1206-10	5	5	9	7	5	9	9	9	
B1208-24	5	5	9	7	5	9	9	9	Discard
B1210-1	2	5	9	5	5	9	7	9	Discard
B1210-11	3	3	9	3	5	9	9	9	Discard
B1210-6	7	7	9	5	5	9	9	9	Discard
B1213-7	5	5	9	7	5	9	9	9	
B1214-4	2	7	9	7	7	9	9	9	Discard
B1214-7	3	3	9	7	7	9	9	9	
B1216-3	2	5	9	9	5	9	9	9	Discard
B1236-3	2	5	9	9	5	9	9	9	Discard
B1239-3	2	5	9	9	5	9	7	9	Discard
B1240-1	2	5	9	7	5	9	9	9	
B1240-12	5	3	9	9	5	9	9	9	
B1240-14	2	5	9	9	5	9	9	7	
Suncrisp	5	5	9	7	7	9	7	9	

BARC Table 4. Continued

Temperature		50°F		45°F		40°F		40°-70°F		50°F		45°F		40°F		40°-70°F	
Date		1/14	Spt ¹²	1/15	1/16	1/17	2/5	2/7	2/7	2/7	2/3	2/7	2/7	2/7	2/3	2/3	2/3
Pedigree	Chip ¹²	Spt ¹³	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip
Abnaki	8.1	M	8.4	S	9.9	O	9.0	S	8.0	L	8.1	L	9.4	O	8.6	S	
Atlantic	6.9	L	6.6	L	8.9	O	7.3	M	6.5	VL	6.6	L	8.8	O	6.0	M	
B1157-5	6.5	VL	6.8	VL	10.0	O	7.8	M	7.0	VL	7.0	VL	8.8	O	6.9	M	
B1206-10	6.8	VL	6.8	VL	9.8	O	7.9	S	7.3	VL	7.4	VL	9.4	O	7.5	L	
B1208-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1210-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1210-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1210-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1213-7	7.7	M	7.7	M	10.0	O	10.0	S	7.7	L	7.9	L	10.0	O	8.9	M	
B1214-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1214-7	8.8	S	8.7	S	10.0	O	10.0	S	8.8	M	8.5	M	10.0	O	9.0	S	
B1216-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1236-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1239-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B1240-1	6.5	S	6.6	S	9.4	O	7.8	S	6.5	L	7.0	L	8.4	O	7.3	S	
B1240-12	7.8	VL	7.3	VL	10.0	O	8.0	S	7.7	VL	7.0	VL	9.6	O	8.0	M	
B1240-14	7.2	VL	7.1	VL	9.6	O	7.4	M	7.0	VL	6.8	VL	9.0	O	7.3	M	
Suncrisp	6.7	VL	6.3	VL	8.3	O	7.5	M	6.4	VL	6.9	VL	8.5	O	6.5	M	

BARC Table 5. Yield, tuber size distribution, and quality characteristics of round whites harvested 133 days after planting at Echo Lake in 1996.

Pedigree	% Stand ¹	Mkt CWT/A	%Mkt	% Tuber Size Distribution					SG ²	HH ³
				<1 7/8"	1 7/8-2 1/4"	2 1/4-3 1/4"	3 1/4-4"	>4"		
Atlantic	100	461	93	6.6	39.3	46.3	7.7	0.0	95	4
B0718-3	99	298	94	6.2	24.1	64.9	4.8	0.0	72	1
B1248-5	100	325	86	14.3	53.1	32.0	0.6	0.0	84	0
B1255-14	100	337	90	9.7	41.7	46.0	2.6	0.0	-	0
B1273-5	100	332	94	5.5	33.1	55.7	5.7	0.0	-	0
B1275-3	100	318	86	14.4	56.1	29.5	0.0	0.0	-	1
B1279-4	100	302	93	4.9	29.4	53.0	10.5	2.1	87	3
B1283-2	100	469	97	3.4	19.5	64.0	13.1	0.0	81	0
B1291-6	100	405	87	1.2	4.8	42.4	39.4	12.2	-	5
B1293-2	100	408	94	2.6	19.6	60.8	13.9	3.1	-	6
B1293-3	100	359	94	4.6	30.8	53.5	9.3	1.8	-	2
B1303-14	99	328	79	1.6	6.9	30.9	40.8	19.9	-	4
B1304-2	100	387	94	6.2	32.6	56.9	4.2	0.0	-	0
B6603-12	100	334	86	14.4	58.6	26.5	0.5	0.0	93	0
B7200-33	99	440	90	9.8	52.8	37.5	0.0	0.0	68	0
Coastal Chip	100	382	92	7.6	40.5	48.6	3.2	0.0	83	0
MN13540	100	350	94	6.1	37.9	54.0	2.0	0.0	72	0
Superior	100	380	94	6.5	27.9	57.6	8.0	0.0	76	0
LSD (.05)		60								

¹⁻¹³ See Table 1

BARC Table 5. Continued

Pedigree	Shape ⁴	Eye Depth ⁵	Sgr ⁶	GC ⁷	SS ⁸	HS ⁹	GR ¹⁰	SB ¹¹	Harvest
Atlantic	2	5	7	5	5	9	9	9	
B0718-3	6	8	9	9	5	9	9	5	
B1248-5	2	7	9	9	5	9	9	5	
B1255-14	2	5	9	9	5	9	9	9	Discard
B1273-5	2	5	9	9	5	9	9	9	Discard
B1275-3	4	7	9	9	5	9	8	7	Discard
B1279-4	5	5	9	9	5	9	9	9	
B1283-2	2	5	9	7	5	9	9	9	
B1291-6	7	7	5	7	5	9	5	9	Discard
B1293-2	5	5	3	9	5	9	9	7	Discard
B1293-3	5	5	5	9	5	9	9	9	Discard
B1303-14	5	5	7	7	5	9	5	9	Discard
B1304-2	5	5	9	9	5	9	9	9	Discard
B6603-12	2	5	8	9	5	9	9	5	
B7200-33	7	7	9	5	5	9	9	9	
Coastal Chip	2	3	9	9	5	9	9	8	
MN13540	5	5	9	9	5	9	9	9	
Superior	3	7	9	7	5	9	5	9	

BARC Table 5. Continued

Temperature Date	50°F 1/21	45°F 1/21	40°F 1/21	40°-70°F 1/7	50°F 2/5	45°F 2/7	40°F 2/7	40°-70°F 2/4
Pedigree	Chip ¹² Spt ¹³	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt	Chip Spt
Atlantic	6.7 L	6.8 M	8.6 S	7.3 M	6.7 VL	7.0 VL	8.7 O	7.0 L
B0718-3	8.0 S	8.2 S	10.0 S	8.3 S	8.1 L	8.5 L	9.8 O	8.2 M
B1248-5	7.7 L	7.7 VL	9.3 S	9.0 S	7.9 VL	8.1 VL	9.1 S	8.7 L
B1255-14	-	-	-	-	-	-	-	-
B1273-5	-	-	-	-	-	-	-	-
B1275-3	-	-	-	-	-	-	-	-
B1279-4	7.0 S	6.0 L	8.0 O	8.0 S	6.0 M	6.0 S	8.0 O	8.0 L
B1283-2	6.6 M	7.1 S	8.6 O	7.5 S	6.8 L	6.8 M	8.6 O	8.0 M
B1291-6	-	-	-	-	-	-	-	-
B1293-2	-	-	-	-	-	-	-	-
B1293-3	-	-	-	-	-	-	-	-
B1303-14	-	-	-	-	-	-	-	-
B1304-2	-	-	-	-	-	-	-	-
B6603-12	6.3 VL	6.6 VL	8.4 S	6.5 L	6.5 VL	6.5 VL	8.1 S	7.1 VL
B7200-33	8.0 M	8.3 M	9.8 S	9.1 S	8.5 VL	8.9 L	10.0 O	8.7 M
Coastal Chip	5.8 VL	6.0 VL	8.3 S	6.8 M	6.6 VL	6.3 VL	8.5 O	6.6 L
MN 13540	6.9 S	7.2 S	9.2 O	8.4 S	7.2 S	7.2 S	9.8 O	8.1 S
Superior	7.0 VL	7.6 VL	9.7 S	8.7 M	7.2 VL	7.4 VL	9.5 O	8.3 L

BARC Table 6. Yield, tuber size distribution, and quality characteristics of russets harvested 133 days after planting at Echo Lake in 1996.

Pedigree	% Stand ¹	Mkt CWT/A	%Mkt	% Tuber Size Distribution					SG ²	HH ³
				<2 oz	2-6 oz	6-10 oz	10-16 oz	>16 oz		
B0493-8	99	363	94	2.6	15.7	61.2	16.9	3.7	-	0
B0835-11	100	343	96	3.6	25.7	65.2	5.5	0.0	73	3
B0915-3	100	375	97	3.3	19.5	65.6	11.6	0.0	76	1
B1004-8	100	289	90	10.2	52.6	37.2	0.0	0.0	83	0
B1292-1	100	261	81	18.5	49.4	32.1	0.0	0.0	-	5
B1300-2	100	201	84	15.5	39.1	42.9	2.5	0.0	-	1
B9922-11	100	358	98	1.7	12.2	69.3	16.9	0.0	86	0
Krantz	96	285	95	4.9	29.7	57.8	7.6	0.0	82	0
Russet Burbank	100	278	89	10.7	58.9	30.5	0.0	0.0	79	0
LSD (.05)		55								

1-11, 13 See Table 1

BARC Table 6. Continued

Pedigree	Shape ⁴	Eye Depth ⁵	Sgr ⁶	GC ⁷	SS ⁸	HS ⁹	GR ¹⁰	SB ¹¹	Harvest
B0493-8	8	5	8	9	5	9	9	9	Discard
B0835-11	7	7	9	5	5	9	9	7	
B0915-3	8	5	9	5	5	9	9	9	
B1004-8	7	7	9	5	5	9	9	9	
B1292-1	8	3	9	9	5	9	9	9	Discard
B1300-2	8	5	9	9	5	9	9	9	Discard
B9922-11	8	5	9	7	5	9	9	7	
Krantz	5	3	9	7	5	9	9	9	
Russet Burbank	8	5	9	9	5	9	9	9	

BARC Table 6. Continued

Temperature	50°F	45°F	40°F	40°-70°F	50°F	45°F	40°F	40°-70°F
Date	1/8	1/8	1/13	1/7	2/4	2/4	2/4	2/4
Pedigree	Fry ¹²	Spt ¹³	Fry	Spt	Fry	Spt	Fry	Spt
B0493-8	-	-	-	-	-	-	-	-
B0835-11	4.0	O	5.0	O	3.1	O	4.7	O
B0915-3	3.3	O	4.2	O	2.4	M	4.2	O
B1004-8	3.2	O	5.0	O	2.5	M	4.3	O
B1292-1	-	-	-	-	-	-	-	-
B1300-2	-	-	-	-	-	-	-	-
B9922-11	2.8	S	4.5	O	2.5	M	4.8	O
Krantz	2.1	M	4.2	O	1.5	VL	4.3	O
Russet Burbank	3.4	O	5.0	O	3.0	S	4.7	O

¹²Fry 1-3 = Satisfactory¹³Sprout length: O = no sprouts, S < 0.5", M 0.5-1.5", L 1.5-2.5", VL > 2.5"

BARC Table 7. Yield, tuber size distribution, and quality characteristics of specialty types of potatoes harvested 133 days after planting at Echo Lake in 1996.

Pedigree	% Stand ¹	Mkt CWT/A	%Mkt	% Tuber Size Distribution					SG ²	HH ³
				<1 ⁷ / ₈ "	1 ⁷ / ₈ -2 ¹ / ₄ "	2 ¹ / ₄ -3 ¹ / ₄ "	3 ¹ / ₄ -4"	>4"		
B0811-13	99	412	93	5.6	27.8	53.2	12.3	1.1	73	0
B0811-4	100	224	85	15.2	57.7	27.1	0.0	0.0	90	0
B0852-7	100	424	95	5.3	26.3	55.2	13.2	0.0	75	2
B0967-11	100	474	97	2.9	19.4	60.3	17.4	0.0	89	0
B0984-1	100	351	95	3.3	13.8	53.2	28.4	1.3	82	0
B0985-1	83	212	90	10.2	48.5	41.2	0.0	0.0	72	0
B1102-3	100	239	78	21.7	44.8	32.3	1.3	0.0	68	0
B1145-2	100	418	92	7.9	32.9	51.2	8.0	0.0	66	2
Red Pontiac	100	456	92	2.8	13.7	50.3	27.7	5.5	68	0
LSD (.05)		49								

¹⁻¹³ See Table 1

BARC Table 7. Continued

Pedigree	Shape ⁴	Eye Depth ⁵	Sgr ⁶	GC ⁷	SS ⁸	HS ⁹	GR ¹⁰	SB ¹¹	Comments
B0811-13	2	1	9	9	5	9	9	9	red skin, yellow flesh
B0811-4	2	1	9	7	5	9	9	9	red skin
B0852-7	2	5	9	5	5	9	9	7	purple skin
B0967-11	7	5	9	9	5	9	9	9	purple skin
B0984-1	3	3	7	9	5	9	9	9	red skin
B0985-1	2	5	9	5	5	9	9	9	red skin
B1102-3	2	3	9	9	5	9	9	9	red skin
B1145-2	2	3	9	7	5	9	9	9	red skin
Red Pontiac	2	1	9	9	5	9	9	9	red skin

BARC Table 7. Continued

Temperature	50°F	
Date	1/14	
Pedigree	Chip ¹²	Spt ¹³
B0811-13	7.7	S
B0811-4	6.0	M
B0852-7	9.1	S
B0967-11	8.3	VL
B0984-1	6.4	S
B0985-1	6.8	S
B1102-3	8.0	M
B1145-2	7.3	M
Red Pontiac	9.1	L

**United States Department of
Agriculture**

Agricultural Research Service

**Potato Genetics and Enhancement
Project - Madison, Wisconsin**

R. E. Hanneman, Jr.

**Response to Questionnaire on Effect of
Reduction in Enhancement Effort by the
National Cooperative Enhancement Project
on U.S. Potato Improvement Efforts**

In the spring of 1996, a questionnaire was sent out to cooperators of the National Cooperative Enhancement Project seeking their input on a projected reduction in enhancement/pre-breeding efforts with regard to our present program. Our ARS administrators had informally suggested that we significantly reduce our commitment to enhancement/pre-breeding and increase our efforts on more basic research. It is presumed that enhancement needs will be met from priority needs from among existing breeding or related research programs.

The questions and responses to the questionnaire were as follows:

1. If we reduce our enhancement/pre-breeding efforts from 75% at present to 25% , concentrating only on traits we are doing research on such as cold chipping and french frying, late blight, Colorado potato beetle, how will this impact your program?

 0 Significantly 6 Moderately
 4 Little 2 No effect

a. Perceived short term (5-10 yrs) national impact of this change?

 1 Significantly 7 Moderately
 3 Little 1 No effect

b. Perceived long term (20-30 yrs) national impact of this change?

 4 Significantly 6 Moderately
 1 Little 1 No effect

2. If we reduced our enhancement/pre-breeding effort from 75% at present to 0%, how will this impact your program?

 4 Significantly 5 Moderately
 1 Little 2 No effect

a. Perceived short term (5-10 yrs) national impact of this change?

 6 Significantly 4 Moderately
 1 Little 1 No effect

b. Perceived long term (20-30 yrs) national impact of this change?

 8 Significantly 3 Moderately
 0 Little 1 No effect

3. Is an enhancement/pre-breeding effort necessary to serve as a bridge between the genebank (NRSP-6) and the user community?

 10 Yes 1 No 2 Undecided

4. Should we continue to do enhancement for specific high priority traits such as cold chipping, late blight, Colorado potato beetle?

 12 Yes 1 No 0 Undecided

5. Should the National Cooperative Enhancement Project be discontinued?

 1 Yes 10 No 1 Undecided

6. If this National Cooperative Enhancement Project is important to your breeding/enhancement program, would you be willing to support it financially?

 4 Yes 1 No 7 Unable

a. If yes, how much would you be willing to contribute annually?

 1 \$500-1,000 3 \$1,000-2,500
 0 \$2,500-5,000 1 \$5-10,000

Building Blocks for Enhancement

Tuber dormancy. The wild and cultivated species are being evaluated for their tuber dormancy. The tubers were left at room

temperature and evaluated for sprouting. Long tuber dormancy is a known trait of the wild species. In this study, those species having 50% or more tubers sprouting after six months were: *S. gandarillasii*, *S. gourlayi* ssp *gourlayi*, *S. hondelmannii*, *S. incamayoense*, *S. infundibuliforme*, *S. leptophyes*, *S. sparsipilum*, *S. medians*, *S. megistacrolobum*, *S. mochicense*, *S. oplocense*, *S. spagazzinii*, *S. sucrense*, *S. weberbaueri*. Those with 25-50% sprouting after six months were: *S. berthaultii*, *S. brevicaule*, *S. capsicibaccatum*, *S. doddsii*, *S. kurtzianum*, *S. multiinterruptum*, *S. pampasense*. Longer natural tuber dormancy may be a desirable alternative to storing at colder temperatures should we lose sprout inhibitors (Table 1).

Late blight resistance. Fifty-five selected foreign varieties, foreign breeding stocks, late blight differentials and advanced enhancement selections that had either performed well in a previous field test or were known to have resistance were evaluated for late blight resistance in the field at the UW Agricultural Research Station at Hancock. One line, CEX 69-1 (PI 511844) had only 25% of its foliage affected at the end of the season, while all others were 90 to 100% defoliated. Several others were noted to have high resistance until they began to mature. They were the foreign variety, Libertas; the foreign breeding stocks, PI 230659, IAC 2, PI 527315, BL 1-10, and the late blight differentials 1584-C(10), SSRPB 2424a (5), and (mooi) (PI 423656). Some of these showed the hypersensitive reaction producing only small necrotic dots. By the end of the season only CEX 69-1, and PI 527315 were still showing resistance (Table 2).

Colorado potato beetle resistance. In unsprayed field plots at the UW Agricultural Research Station at Hancock, 15 advanced enhancement selections were tested against natural beetle populations. Of the 15 tested, two clones, 95-40355 [US-W 527 (Cherokee) x chc 2002-09] and 95-40359 [US-W 4440 (Merr) x chc 2002-09] showed good resistance and another selection exhibited no damage, 95-30011-1 [US-W 745 (Wis Ag 231) x chc]. The susceptible check varieties were quickly defoliated. Several selections showed early resistance, but were defoliated with the second wave of beetles later in the season (Table 3).

Progeny testing. Eleven advanced enhancement selections were crossed to two cultivars and the progeny were tested for their performance at the UW Lelah Starks Potato Breeding Farm and the Agricultural Research Station at Hancock. At Rhinelander preliminary analysis indicates that the average yield per hill of progeny was 2.9 lbs. Katahdin yielded 5.2 lbs per hill, while Atlantic yielded 4.1 lbs per hill. No family means exceeded the yield of the cultivars. Five families had a total yield less than the mid-parent value and two exceeded mid-parent performance. The percentage of Bs exceeded mid-parent values for 10 of the 14 families. The production of Bs is favored in these crosses. General tuber appearance was good for all families evaluated. Specific gravity and chipping data is still being evaluated (Table 4).

Further studies on introgression of cultivated genes into natural populations

This year, 65 transplant families were evaluated for natural fruit production in the fields at the UW Lelah Starks Potato Breeding Farm at Rhinelander, WI. There was excellent bumblebee activity in the fields this year making this study possible. In the transplant field, pollen shedding was noted as well as fruit set. This study provides evidence for the potential for natural hybridization among F1 progeny, suggesting the potential for further introgression in nature. Every family had individuals which shed some pollen. Some had significant numbers of individuals which shed pollen freely, while others had significant numbers of individuals that did not shed (sterile). There also were plants that did not flower which can reflect sterility. Seed is being extracted to determine fecundity of these natural crosses (Table 5).

Enhancement Project Table 1. Percent of progeny of wild and cultivated species with tuber dormancy of greater than six months.

<u>Species</u>	<u>#PIs</u>	<u>#tubers</u>	<u>%> 6</u>	<u>Species</u>	<u>#PIs</u>	<u>#tubers</u>	<u>%> 6</u>
acl-acl	7	46	4	med	3	12	92
acl-aem	11	170	5	mga	10	46	61
acl-pne	7	37	8	mcd-gig	10	57	0
aln	9	82	16	mcd-mcd	9	46	7
avl	3	33	0	mcc	3	11	91
ber	8	28	25	mlt	7	17	47
blv	10	165	21	nrs	5	52	13
bst	7	23	0	oka	8	47	19
bcp	5	24	0	opl	10	139	65
brc	10	112	49	pam	5	29	34
blb-blb	5	12	0	pta	9	118	3
can	12	50	20	phu	25	174	0
cap	4	27	48	pnt	12	70	1
cph-cph	5	21	5	pld	6	16	0
chc	6	34	0	plt	10	98	7
cmm-cmm	9	42	0	rap	7	30	17
cmm-mlm	8	87	6	sct	9	63	24
dms	5	27	0	spl	10	141	65
dds	10	72	25	spg	10	95	53
fen-fen	10	97	5	stn-gon	2	14	0
fen-azn	6	61	2	stn-stn	8	53	0
gnd	5	58	71	sto	9	65	2
grl-grl	19	323	98	scr	9	178	77
hje	8	20	3	tar	10	78	5
hdm	10	115	78	tor	7	16	6
hou	6	19	0	tbr-adg	90	829	10
inm	6	60	92	tbr-tbr	5	41	0
ifd	10	93	90	vnt	2	25	0
iop	5	24	0	vrn-vrn	8	43	19
jam	7	18	17	vrn-bal	9	65	12
ktz	10	53	40	ver	10	78	1
lph	6	56	80	grl-vid	10	131	87
mrn	7	20	15	wbr	2	7	86

Enhancement Project Table 2. Late blight resistance among selected foreign varieties, foreign breeding stocks, late blight differentials and advanced enhancement selections based on percent defoliation.

Selections	Date				
	8/5	8/8	8/19	8/26	9/3
Libertas	5	10	15	25	90
Talukdari	15	60	98	100	100
KOM D149	10	10	60	75	100
PB sn	5	5	25	75	100
PI 227680	5	10	25	85	100
PI 230659	<5	5	20	60	100
Dee 133.5	5	10	50	100	100
PI 257346.1	20	90	100	100	100
IAC 2	<5	<5	10	40	90
PI 257538	10	20	50	95	100
CEX 69-1	<5	1	<5	15	25
V-2	5	5	25	50	90
PI 527315	1	1	<5	10	60
PI 527316	<5	1	15	40	90
CFS 69.1	5	1	25	80	99
PI 423654 (mooi)	40	60	100	100	100
SSRPB 2182 ef (7)	5	20	60	100	100
1584 c (10)	1	1	10	75	99
SSRPB 2424a (5)	<5	10	20	70	100
PI 423656 (mooi)	<5	5	10	70	100
SSRPB 3750 (5)	<1	<1	30	98	100
95-4087	30	75	100	100	100
Ranger Russet	10	40	100	100	100
Ranger Russet	15	75	100	100	100

Enhancement Project Table 3. Assessment of Colorado potato beetle field resistance among selected enhancement hybrids based on percent defoliation.

Code	Selections	Date		
		8/5	8/19	8/26
1	chc x ADX 497-1	90	90	d
2	US-W 3573 x chc	99	99	d
3	US-W 527 x chc	5	5	little
4	US-W 4440 x chc	10	10	little
5	adg haploid x chc	75	50	d
6	chc x ADX 497-1	d	d	d
7	tar x ADX 497-1	90	d	d
8	tar x ADX 497-1	90	d	d
9	spl x ADX 497-1	d	d	d
10	spl x ADX 497-1	99	d	d
11	spl x ADX 497-1	d	d	d
12	spl x ADX 497-1	d	d	d
13	US-W 745 x chc	0	0	0
14	US-W 4056 x tar	20	50	d
15	US-W 357 x tar	40	d	d
	Norland	95	d	d

note: d= dead

Enhancement Project Table 4. Results of test crosses of 10 selected diploid enhancement hybrids with Atlantic and Katahdin for total yield (lbs) and percent B size tubers.

Cross	Total Yield (lbs)				B Size Tubers			
	f	m	mp	mean	f	m	mp	mean
Katahdin x 1-1	5.2	0.8	3.0	3.1	6	36	21	16
Atlantic x 145-1	4.1	1.6	2.9	2.9	3	9	6	9
Atlantic x 153-2`	4.1	1.8	3.0	3.0	3	17	10	12
Atlantic x 156-3	4.1	2.9	3.5	2.4	3	22	13	17
Katahdin x 156-3	5.2	2.9	4.1	2.9	6	22	14	24
Atlantic x 161-2	4.1	1.2	2.7	3.1	3	7	5	11
Atlantic x 162-2	4.1	1.7	2.9	2.7	3	10	7	12
Katahdin x 162-2	5.2	1.7	3.5	2.0	6	10	8	21
Atlantic x 162-6	4.1	1.2	2.7	3.3	3	25	14	20
Katahdin x 162-6	5.2	1.2	3.2	2.7	6	25	16	27
Katahdin x 59-31	5.2	2.7	4.0	2.2	6	5	6	15
Katahdin x 72-3	5.2	2.4	3.8	3.9	6	20	13	11
Katahdin x 12380-8	5.2	2.3	3.8	3.0	6	5	6	16

note: f=female, m=male, mp=mid-parent

Enhancement Project Table 5. Natural fruit set among interspecific hybrids between wild species and common cultivars.

<u>Code</u>	<u>Parentage</u>	<u>#plants</u>	<u>#shed</u>	<u>#sterile</u>	<u>#fruit</u>
527	(W1005 x iop) x W1005	18	11	0	15
531	(W1005 x amb) x W1005	19	11	0	10
532	(W1005 x ugt) x W1005	23	18	0	23
545	Katahdin x avl	10	8	1	10
554	Katahdin x grl-grl	23	18	0	17
556	Red Pontiac x grl-grl	22	16	1	21
574	W870 x tbr-adg	21	12	7	6
583	Wischip x tbr-adg	21	7	5	9
587	Wischip x cur	21	11	5	8
589	Atlantic x cur	20	8	2	15
592	W870 x stn-stn	18	4	10	5
595	Atlantic x tbr-tbr	15	6	5	13
596	W870 x tbr-tbr	19	16	1	15
600	W870 x opl	20	16	0	19

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NORTH CENTRAL REGIONAL POTATO TRIALS

Richard Novy, Assistant Professor and Bryce Farnsworth, Research Specialist, Plant Sciences Dept., North Dakota State University and Cooperators

Cooperators in 1996:

Iowa, Dr. Bill Summers; Louisiana, Dr. Charlie Johnson and Mr. Gil Barker; Michigan, Dr. Dave Douches; Minnesota, Dr. Jan Backlund; Nebraska, Dr. Alexander D. Pavlista; Ohio, Dr. Richard Hassell; Wisconsin, Dr. Jiming Jiang and Dr. Horia Groza. Technical assistance from Michael Schwalbe in North Dakota is appreciated.

Eight states participated in the North Central Regional Trials in 1996. Indiana withdrew from the trials in 1995 and South Dakota has not yet found a coordinator for their trial. The Canadian provinces of Alberta, Manitoba, and Ontario were unable to obtain the necessary phytosanitary inspection and approval for the importation of seed into Canada. However, it has been indicated that Alberta and Manitoba will again participate in the trials in 1998.

Cultivars Recently Released:

In 1996, North Dakota released a cultivar: NorValley (formerly ND2417-6), whose parentage was Norchip x ND860-2. This white chipping variety is notable for its resistance to the accumulation of reducing sugars under low storage temperatures, its wide adaptability, and its low incidence of internal defects, specifically hollow heart.

Cooperating States 1996

STATE OR PROVINCE	DATE PLANTED	TOTAL DAYS		
		DATE HARVESTED	TO HARVEST	I/D ¹
Iowa	4/25	8/9	106	I
Louisiana	3/4	6/28	117	D
Michigan	5/7	9/16	132	I
Minnesota	4/18	8/26	130	I
Nebraska	5/8	9/23	138	I
North Dakota	5/29	10/12	136	D
Ohio	5/24	9/25 & 26	124-5	D
Wisconsin	4/23	9/24	154	I

¹ I = Irrigated (most irrigation was supplemental to rainfall); D = Dryland

Trial conditions: The overall objective of the trial is to test the performance of advanced selections for uniformity over a wide variety of locations and environments.

In most cases, rainfall was supplemented with irrigation, but three sites were dryland (ND, OH, LA). Adverse growing conditions in North Dakota (flooding of trial) and Louisiana (very dry followed by wet conditions) dramatically lowered yields and did not allow for an effective evaluation of the entries' merits. Their trial results have been included only in Tables 1, 2 and 3. Regional averages for these three tables *do not* include Louisiana or North Dakota.

Entries: Ten entries were received from Minnesota, Michigan, Wisconsin and North Dakota. Seed of the check varieties Norchip, Atlantic, Snowden, Dark Red Norland, Red Pontiac, Russet Burbank, and Russet Norkotah were supplied by North Dakota in order to ensure a standard seed source. All entries were 1st year entries with the exception of MSB076-2, MSB007-1, ND2225-1R, and W1242 (all in their second-year of evaluation).

The entries were:

MN16180	pale, yellow fleshed tablestock
MN16489	pink-eyed white chipper
MSB007-1	white tablestock
MSB076-2	white chipper
MSB106-7	russet tablestock
ND2225-1R	red tablestock
ND2676-10	white chipper
W1151Russ	russet tablestock
W1242	white chipper
W1313	white chipper

Total and US No. 1 Yield: Under irrigation, MSB106-7 (405 cwt/A), W1313 (399 cwt/A), and MSB076-2 (389 cwt/A) had the highest total yield. Under dryland conditions at the Ohio site, Red Pontiac, MSB106-7, and MSB076-2 were the top three entries for total yield. As a note, MSB106-7 had a relatively high total yield even under the adverse growing conditions at the Louisiana site. Under irrigation, W1313 (365 cwt/A), MSB106-7, (363 cwt/A) and MSB076-2 (344 cwt/A) were the top three entries for U.S. No. 1 yield. Under dryland conditions (Ohio) Red Pontiac, MSB076-2, and Dark Red Norland / MN16180-10 (tied) were the top three entries for U.S. No. 1 yield. (North Central Regional Trial Tables 1 and 2).

Percent U.S. No. 1: The range for percent U.S. No. 1 was 71% (Russet Burbank) to 91% (Atlantic). Of the entries, W1242 had the highest percentage of U.S. No. 1 at 87%,

followed closely by ND2676-10 at 85%. (North Central Regional Trial Table 3).

Maturity: Dark Red Norland was the earliest maturing entry while Russet Burbank was the latest maturing. With the exception of the earlier-maturing North Dakota entries, all entries were classified as medium maturity. (North Central Regional Trial Table 4).

Specific Gravities: W1313 had the highest specific gravity at 1.090, followed closely by MSB076-2 and Atlantic at 1.089 and 1.088 respectively. As expected, the lowest specific gravities were observed in the red cultivars and selections (1.062-66). Russet selection W1151Russ also had a low specific gravity with a value of 1.065 (North Central Regional Trial Table 5).

Scab Reaction: Scab ratings were taken and reported from the Iowa, Minnesota, and Wisconsin sites. Of the three sites, Minnesota reported the most severe incidence with respect to area and type. The percentage of tubers displaying scab symptoms was highest in W1313 (9.1%), MSB007-1 (8.7%), and Atlantic (8.0%) and lowest (0%) in Norchip, MN16180, MSB076-2, and MSB106-7. (North Central Regional Trial Table 6 and Scab column in North Central Regional Trial Table 7).

Summary of Grade Defects: Freedom from external defects ranged from 81.5% (Russet Burbank) to 93.4% (Snowden), while freedom from internal defects ranged from 66.5% (W1242) to 97.8% (MSB007-1) (North Central Regional Trial Table 7).

Chip Color: Chip color results are reported as Agtron values or PCII Color Chart values. Chip scores are directly from the field; chip scores from long term storage were not available. All chipping entries performed as well as the standards, Atlantic, Norchip and Snowden. Surprisingly, MN16180 which was classified as a tablestock entry chipped well and could have potential as a dual-usage variety. (North Central Regional Trial Table 8).

Overall Merit Ratings: The following summary shows the top five entries from 1996 and indicates the total points based on merit rating for these entries over the previous two years. (North Central Regional Trial Table 9).

Selection	Total Points		
	1994	1995	1996
MSB076-2	NE*	8	15
MN16180	NE	NE	11
Dark Red Norland	7	6	9
MN16489	NE	NE	8
W1313	NE	NE	7

*Not Entered

North Central Regional Trial Table 1. Total Yield (cwt/acre) - 1996

Cultivar or Selection	IA^{1/}	MI^{1/}	MN^{1/}	NE^{1/}	OH^{2/}	WI^{1/}	Ave.^{3/}	LA^{2/}	ND^{2/}
Atlantic	197	387	342	339	--	462	345	146	64
Dark Red Norland	186	352	242	387	322	418	317	118	52
Norchip	193	334	250	291	288	343	283	97	64
Red Pontiac	230	415	434	333	461	502	396	129	83
Russet Burbank	159	401	385	224	293	440	317	30	39
Russet Norkotah	180	235	279	289	207	393	264	75	73
Snowden	197	330	216	402	--	415	312	111	32
MN16180	228	340	361	267	339	531	344	124	68
MN16489	193	361	410	374	333	491	360	68	75
MSB007-1	103	345	397	223	253	471	299	105	58
MSB076-2	170	459	354	384	373	582	387	133	76
MSB106-7	212	505	421	327	415	558	406	267	67
ND2225-1R	164	334	289	237	211	481	286	87	52
ND2676-10	180	329	290	238	294	398	288	109	48
W1151Russ	154	286	280	346	155	364	264	--	39
W1242	141	330	261	399	221	457	302	138	40
W1313	154	496	416	441	343	486	389	--	45
Average	179	367	331	324	301	458	327	116	57

^{1/}Irrigated^{2/}Dryland^{3/}LA and ND are not included in average

North Central Regional Trial Table 2. U.S. No. 1 Yield (cwt/acre) - 1996

Cultivar or Selection	IA	MI	MN	NE	OH	WI	Ave.^{1/}	LA	ND
Atlantic	163	345	314	334	--	427	317	115	37
Dark Red Norland	159	313	227	381	251	392	287	80	18
Norchip	142	271	221	285	173	311	234	28	27
Red Pontiac	150	374	421	330	309	439	337	63	46
Russet Burbank	77	280	361	205	123	353	233	0	3
Russet Norkotah	147	149	249	277	126	330	213	0	43
Snowden	142	277	205	397	--	387	282	68	7
MN16180	144	228	325	261	251	484	282	61	22
MN16489	136	313	373	362	223	434	307	27	28
MSB007-1	57	296	360	209	167	438	255	57	26
MSB076-2	108	389	324	378	280	522	334	74	31
MSB106-7	159	424	396	313	208	523	337	106	27
ND2225-1R	90	250	247	218	156	430	232	53	24
ND2676-10	128	273	258	225	244	362	248	70	31
W1151Russ	101	228	264	327	110	331	227	--	14
W1242	98	299	246	392	170	429	272	97	15
W1313	97	457	380	438	206	454	339	--	19
Average	123	304	304	314	200	415	277	60	25

^{1/} LA and ND not included in average

North Central Regional Trial Table 3. Average Percent U.S. No. 1 (over 2" Dia) - 1996

Cultivar or Selection	IA	MI	MN	NE	OH	WI	Ave.^{1/}	LA	ND
Atlantic	83	89	92	99	--	92	91	79	58
Dark Red Norland	86	89	94	99	78	94	90	67	35
Norchip	74	81	88	98	60	90	81	28	42
Red Pontiac	65	90	97	99	67	88	84	48	55
Russet Burbank	49	70	94	92	42	81	71	0	8
Russet Norkotah	82	63	89	96	61	84	79	0	59
Snowden	72	84	95	99	--	93	74	61	22
MN16180	63	67	90	98	74	91	81	49	32
MN16489	71	87	91	97	67	88	84	39	37
MSB007-1	55	86	91	94	66	93	81	53	45
MSB076-2	64	85	92	98	75	90	84	55	41
MSB106-7	75	84	94	96	50	94	82	39	40
ND2225-1R	55	75	85	92	74	89	78	61	46
ND2676-10	71	83	89	95	83	91	85	63	65
W1151Russ	66	80	94	95	71	91	83	--	36
W1242	69	91	94	98	77	94	87	69	38
W1313	63	92	91	99	60	94	83	--	42
Average	68	92	92	97	67	90	82	47	41

^{1/} LA and ND not included in average

North Central Regional Trial Table 4. Maturity Classification^{1/} - 1996

Cultivar or Selection	IA	MI	MN	NE	OH	WI	Ave.
Atlantic	3.0	3.5	4.0	--	--	5.0	3.9
Dark Red Norland	2.0	1.0	1.8	--	1.0	1.0	1.4
Norchip	2.0	3.0	3.0	--	2.0	1.5	2.3
Red Pontiac	3.0	4.0	2.2	--	3.0	5.0	3.4
Russet Burbank	5.0	4.0	5.0	--	5.0	5.0	4.8
Russet Norkotah	4.0	1.5	2.5	--	3.0	2.5	2.7
Snowden	3.0	3.0	3.5	--	--	2.5	3.0
MN16180	3.0	2.0	3.5	--	3.0	5.0	3.3
MN16489	2.0	2.0	3.5	--	4.0	5.0	3.3
MSB007-1	3.0	4.0	3.0	--	4.0	4.3	3.7
MSB076-2	3.0	3.0	3.8	--	3.0	5.0	3.6
MSB106-7	4.0	3.0	3.8	--	4.0	3.3	3.6
ND2225-1R	2.0	2.0	2.5	--	3.0	2.5	2.4
ND2676-10	2.0	3.0	3.0	--	3.0	1.3	2.5
W1151Russ	4.0	4.0	3.8	--	3.0	3.0	3.6
W1242	3.0	4.0	3.2	--	4.0	2.5	3.3
W1313	2.0	4.0	3.8	--	4.0	4.3	3.6
Average	3.0	3.0	3.3	--	3.3	3.5	3.2

- ^{1/}
- | | |
|--|--|
| 1. Very Early - Irish Cobbler Maturity | 4. Late - Katahdin Maturity |
| 2. Early - Norland Maturity | 5. Very late - Russet Burbank Maturity |
| 3. Medium - Red Pontiac Maturity | |

North Central Regional Trial Table 5. Specific Gravities - 1996¹

Cultivar or Selection	IA	MI	MN	NE	OH	WI	Ave.
Atlantic	84	92	93	84	--	88	88
Dark Red Norland	63	63	60	59	63	64	62
Norchip	81	77	80	71	75	83	78
Red Pontiac	54	64	72	60	60	63	62
Russet Burbank	76	82	87	60	74	85	77
Russet Norkotah	75	70	70	70	66	68	70
Snowden	76	86	89	79	--	84	83
MN16180	76	72	74	75	74	87	76
MN16489	76	75	86	76	84	79	79
MSB007-1	76	70	79	75	74	76	75
MSB076-2	81	94	94	83	85	95	89
MSB106-7	65	71	75	81	63	76	72
ND2225-1R	65	65	64	69	62	68	66
ND2676-10	81	76	79	83	79	79	80
W1151Russ	65	65	71	60	69	61	65
W1242	76	85	82	75	75	85	80
W1313	83	95	97	87	83	97	90
Average	74	77	80	73	72	79	76

¹ "88" is abbreviation for a specific gravity value of 1.088

North Central Regional Trial Table 6. Scab Reaction Report - Most Representative Scab (Area/type)^{1/} - 1996

Cultivar or Selection	IA	MI	MN	NE	OH	WI
Atlantic	--	--	0-0	--	--	T-4
Dark Red Norland	T-1	--	1-3	--	--	T-1
Norchip	T-2	--	0-0	--	--	1-2
Red Pontiac	T-2	--	2-3	--	--	1-4
Russet Burbank	T-2	--	0-0	--	--	0-0
Russet Norkotah	0-0	--	1-2	--	--	1-2
Snowden	--	--	1-5	--	--	T-3
MN16180	0-0	--	0-0	--	--	0-0
MN16489	T-1	--	0-0	--	--	0-0
MSB007-1	T-3	--	3-1	--	--	1-4
MSB076-2	0-0	--	0-0	--	--	T-3
MSB106-7	0-0	--	0-0	--	--	T-1
ND2225-1R	T-1	--	2-2	--	--	T-3
ND2676-10	0-0	--	2-4	--	--	T-1
W1151Russ	0-0	--	3-5	--	--	T-2
W1242	0-0	--	1-5	--	--	T-1
W1313	0-0	--	2-5	--	--	1-4

^{1/} Area	Type
T = less than 1%	1 = Small, superficial
1 = 1-20%	2 = Larger, superficial
2 = 21-40%	3 = Larger, rough pustules
3 = 41-60%	4 = Larger pustules, shallow eyes
4 = 61-80%	5 = Very large pustules, deep holes
5 = 80-100%	

North Central Regional Trial Table 7 . Summary of Grade Defects - 1996.

Cultivar or Selection	Scab ^{2/}	External ^{1/}					Internal ^{1/}			
		Growth Cracks	Off Shape & Second Growth	Tuber Rot	Sun Green	Total Free of External Defects ^{3/}	Hollow Heart	Internal Necrosis	Vascular Discoloration	Total Free of Internal Defects ^{4/}
Atlantic	8.0	1.3	2.6	0.5	6.2	89.5	10.0	10.5	7.3	69.5
Dark Red Norland	4.0	3.8	2.0	0.0	3.1	92.8	3.7	4.7	5.0	88.2
Norchip	0.0	6.5	6.4	0.5	1.8	84.9	1.5	3.4	9.8	85.5
Red Pontiac	2.3	2.4	9.7	1.0	2.5	84.7	5.3	1.2	5.5	88.7
Russet Burbank	0.0	2.6	14.5	0.9	0.5	81.5	13.7	2.7	4.8	79.3
Russet Norkotah	1.0	0.0	11.4	0.6	2.7	85.4	5.5	0.7	3.1	92.2
Snowden	4.0	1.4	1.2	0.3	3.6	93.4	6.0	2.3	11.5	82.8
MN16180	0.0	0.4	6.1	0.1	5.3	88.3	2.0	0.5	4.0	93.7
MN16489	1.7	2.2	6.3	0.1	4.9	85.6	3.9	0.0	1.7	95.1
MSB007-1	8.7	0.0	6.0	0.1	6.7	83.5	0.0	1.0	1.2	97.8
MSB076-2	0.0	1.3	5.5	0.1	0.9	91.9	2.3	1.3	1.2	95.5
MSB106-7	0.0	3.4	7.9	0.2	2.0	86.5	0.8	8.5	6.7	84.0
ND2225-1R	6.3	0.6	3.4	0.0	3.3	92.8	0.7	1.8	4.6	92.8
ND2676-10	3.6	0.8	4.9	0.5	2.6	91.0	7.7	5.7	10.0	80.0
W1151Russ	0.3	0.3	9.4	0.6	1.5	88.7	8.1	0.8	8.7	77.2
W1242	0.3	0.6	7.9	0.1	2.9	88.7	30.0	1.7	2.2	66.5
W1313	9.1	1.0	7.3	0.4	5.4	84.6	2.2	15.7	4.8	78.0
Average	2.9	1.7	6.6	0.4	3.3	87.9	6.1	3.7	5.4	85.1

^{1/} Based on four 25 tuber samples (one from each replication). Percentage based on number of tubers.

^{2/} Number of tubers with scab of 100 tubers rated. Does not count in external defects.

^{3/} Tubers free from any external defect of any sort.

^{4/} Percentage of normal tubers showing no internal defects. Individual tubers may have more than one type of internal defect.

North Central Regional Trial Table 8. Chip Color - 1996

Cultivar or Selection	IA	MI^{1/}	MN	NE^{2/}	OH^{1/}	WI^{1/}
Atlantic	--	1.5	--	56	--	3.6
Dark Red Norland	--	3.5	--	43	1.0	5.6
Norchip	--	1.5	--	58	1.0	3.9
Red Pontiac	--	4.0	--	29	1.0	10.0
Russet Burbank	--	3.5	--	28	1.0	5.8
Russet Norkotah	--	3.5	--	34	1.5	5.9
Snowden	--	1.5	--	59	--	2.9
MN16180	--	2.0	--	60	1.0	3.5
MN16489	--	1.5	--	66	2.0	3.3
MSB007-1	--	2.5	--	48	1.0	6.3
MSB076-2	--	1.5	--	63	1.5	3.9
MSB106-7	--	3.0	--	45	1.5	5.8
ND2225-1R	--	3.0	--	25	1.0	7.3
ND2676-10	--	1.5	--	60	1.0	3.1
W1151Russ	--	3.0	--	30	1.0	6.7
W1242	--	1.5	--	59	2.0	3.1
W1313	--	1.5	--	62	1.0	3.4
Average	--	2.4	--	49	1.2	4.9

^{1/} PCII Color Chart (1 = lightest; 10 = darkest)

^{2/} Agtron (Highest number lightest)

North Central Regional Trial Table 9. General Merit Rating Points - 1996

Cultivar or Selection	IA	MI	MN	NE	OH	WI	Total Points
Atlantic						4	4
Dark Red Norland	4	3		2			9
Norchip	5						5
Red Pontiac							
Russet Burbank							
Russet Norkotah			1			3	4
Snowden				1			1
MN16180	3		2		1	5	11
MN16489		4	4				8
MSB007-1			5				5
MSB076-2	2	5	3	5			15
MSB106-7		2		4			6
ND2225-1R					4	2	6
ND2676-10	1				3		4
W1151Russ							
W1242					5		5
W1313		1		3	2	1	7

^{1/} Merit Ratings	<u>Rating</u>	<u>Points</u>	1. MSB076-2 - 15 points
	1	5	2. MN16180 - 11 points
	2	4	3. Dark Red Norland - 9 points
	3	3	4. MN16489 - 8 points
	4	2	5. W1313 - 7 points
	5	1	

WESTERN REGIONAL POTATO VARIETY TRIAL

J. J. Pavek, D. L. Corsini, and Cooperators

Uniform Potato Yield Trial

The 1996 trial was grown at twelve locations for yield; disease data are from two of the locations. Sixteen entries, 12 experimental, three standard checks, and one early check, were grown. Three locations grew entries for both early and late harvest. The trial locations, dates of planting, vine killing, and harvest, and

days from planting to vine-kill/harvest are shown below. Cultural practices and the use of fertilizer, herbicides, pesticides, and vine killing varied according to local conditions. Trial plots at all locations were irrigated on a regular schedule throughout the entire growing season according to plant needs. The growing season temperatures were above normal across the region.

Pavek, Breeder, and Corsini, Pathologist, USDA-ARS, Univ. of Idaho, PO Box AA, Aberdeen, ID 83210. Cooperators: California, R. Voss; Colorado, D. Holm; Idaho, S. Love; New Mexico, A. Carter, E.J. Gregory; Oregon, A. Mosley, D. Hane, K. Rykbost, C. Shock, S. James; Texas, D. Smallwood, J. C. Miller, Jr.; Washington, R. Thornton, L. Mikitzel, C. Brown.

Data on vines, tubers, yield, internal quality, disease reactions, merit scores, and disposition are presented in Western Tables 1 through 7. Three clones finished three years of testing, and may be further tested locally. Two clones were dropped, and the rest will continue in testing. TXNS112, a Russet Norkotah strain, appeared outstanding for fresh use.

State	Location	Planting Date	Vine-Kill Date	Harvest Date	Days to Vine-Kill/ Harvest
California	Kern Co.	2/15	—	6/17	—/123
"	Tulelake	5/15	9/13	9/25	121/133
Colorado	San Luis Valley	5/19	8/31	9/24	104/128
Idaho	Aberdeen	4/29	8/30	9/16	123/140
"	Kimberly-Early	4/25	7/31	8/7	97/104
"	Kimberly-Late	4/25	—	9/18	—/146
New Mexico	Clovis	3/20	8/2	8/14	135/147
"	Farmington	4/19	—	10/1	—/165
Oregon	Hermiston-Early	3/20	7/30	8/13	132/146
"	Hermiston-Late	4/19	9/17	9/30	151/164
"	Klamath Falls	5/24	9/12	9/27	111/126
"	Malheur	4/23	9/13	9/20	143/150
Texas	Springlake	3/28	8/10	8/20	135/145
Washington	Othello-Early	4/17	8/16	8/27	121/132
"	Othello-Late	4/22	9/19	10/1	150/162

Western Table 1. 1996 Seed source, stand, tuber and vine characteristics, and foliar and tuber diseases at Aberdeen, ID.

1/

Entry	Year in	Seed Source	Stand (8 loc) %	TUBER		VINE		Vert. Wilt	Early Blight	Common Scab	Net				Late Blight	
				Shape	Skin	Size	Mat				Necrosis		Erwinia		Fol.	Tuber
											Hrm	KIM	Soft Rot			
RUSSET BURBANK	ck	OR	95	L	RUS	ML	ML	S	MS	R	MS	S	R	S	R	
RANGER RUSSET	ck	OR	96	L	RUS	ML	ML	R	MS	MS	S	MS	S	S	MS	
RUSSET NORKOTAH	ck	OR	97	L	RUS	S	E	VS	S	R	MS	MS	MS	VS	VS	
A82360-7	2	ID	97	O	RUS	L	L	R	MR	R	MR	R	MS	MR	MR	
A84118-3	3	OR	92	O	RUS	ML	ML	MR	MR	R	MS	MS	S	MR	R	
A86102-6	1	OR	95	O	RUS	ML	ML	MR	S	R	R	MS	MS	S	S	
A8792-1	1	OR	91	O	RUS	L	L	MR	MR	MR	MR	S	MS	MS	MS	
AO85165-1	3	OR	94	O	RUS	ML	ML	MR	MS	VR	S	S	S	S	S	
CO85026-4	2	CO	92	O	RUS	M	ML	R	MR	VR	MR	R	S	MS	MS	
TX1229-2Ru	3	OR	89	O	WHT	M	ML	S	S	R	MR	MS	VS	VS	S	
TX1385-12Ru	1	CO	97	O	RUS	M	M	MR	S	MR	MR	-	VS	S	S	
TXAV657-27Ru	2	CO	92	O	RUS	ML	ML	MR	MS	MR	S	S	S	VS	S	
TXNS112	1	CO	98	L	RUS	S	E	S	MS	R	MS	-	MS	-	-	
TXNS278	1	CO	97	L	RUS	S	E	S	S	R	MS	-	S	-	-	
SHEPODY	ck	OR	88	O	WHT	M	M	MS	S	S	-	S	VS	S	VS	
ATX84706-2Ru	2	OR	81	O	WHT	ML	ME	VS	S	S	-	MS	S	VS	S	

1/ Shape: L = long, O = oblong, R = round; Vine size: L = large, ML = medium-large; M = medium, MS = medium-small, S = small; Mat = maturity; L = late, ML = medium-late, M = medium, ME = medium-early, E = early; Disease reaction: R = resistant, VR = very resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible.

Western Table 2. 1996 Total tuber yield, cwt/acre; early harvest and late harvest. ^{1/}

Entry	Early Harvest							Late Harvest										
	Calif			Texas			Wash	Idaho			Oregon			Wash				
	Krn	Kim	NMex	Hrm	Oregon	Spr		Oth	Mean	Tul	Colo	Slv	Ab	Kim	Frm	Hrm	Klm	Mal
RUSSET BURBANK	432	256	238	626	341	341	432	388	508	560	439	303	472	708	455	472	665	509
RANGER RUSSET	303	241	294	708	306	306	377	371	527	541	431	297	543	716	459	547	771	537
RUSSET NORKOTAH	356	245	141	502	267	267	302	302	356	384	304	283	307	438	437	363	685	395
A82360-7	-	-	-	-	-	-	-	-	528	-	480	269	495	-	493	605	744	516
A84118-3	-	-	-	-	-	-	-	-	452	-	369	201	343	677	391	427	541	425
A86102-6	465	241	234	767	282	282	520	418	505	-	517	338	661	669	518	523	649	548
A8792-1	471	252	176	671	311	311	283	361	618	-	513	348	421	809	552	571	579	551
AO85165-1	442	237	204	716	387	387	428	402	541	-	471	350	410	859	463	559	728	548
CO85026-4	387	89	237	521	290	290	187	285	466	370	221	156	388	629	409	415	735	421
TX1229-2Ru	219	275	214	592	314	314	423	340	517	473	370	307	463	488	454	521	723	480
TX1385-12Ru	-	274	285	644	451	451	473	425	459	419	496	307	-	731	474	565	982	554
TXAV657-27Ru	453	245	256	706	384	384	391	406	489	609	432	312	475	855	558	593	908	581
TXNS112	-	272	270	690	357	357	378	393	457	522	415	325	328	671	562	479	693	495
TXNS278	-	279	248	646	312	312	351	367	472	479	354	373	337	630	541	449	693	481
SHEPODY	214	245	-	651	-	-	413	381	-	-	-	-	-	-	-	-	-	-
ATX84706-2Ru	130	302	231	619	322	322	373	330	-	-	-	-	-	-	-	-	-	-
Location Means	352	247	233	647	333	333	381	369	493	484	415	298	434	683	483	506	721	503

Western Table 3. 1996 U.S. No. 1's, percent of total yield for locations; overall mean, percent and cwt/acre; early and late harvest.

Entry	Early Harvest										Late Harvest																			
	Calif					Texas					Mean					Idaho					Oregon					Wash				
	Krn	Kim	NMex	Hrm	Spr	Wash	%		Tul	Colo	Slv	Ab	Kim	Frm	Hrm	Klm	Mal	Oth	%	cwt/A										
RUSSET BURBANK	87	39	10	59	81	63	57	236	81	82	70	49	90	68	71	45	55	68	348											
RANGER RUSSET	91	68	29	76	81	85	74	272	74	91	86	73	89	72	78	73	72	79	421											
RUSSET NORKOTAH	93	69	44	77	78	74	73	230	78	89	72	73	88	66	83	83	83	79	316											
A82360-7	-	-	-	-	-	-	-	-	74	-	85	58	77	-	75	70	76	74	385											
A84118-3	-	-	-	-	-	-	-	-	74	-	82	49	92	75	75	77	71	74	320											
A86102-6	86	40	47	80	77	76	69	305	82	-	74	68	94	66	78	52	66	73	399											
A8792-1	97	58	44	76	92	73	73	281	78	-	81	73	90	82	81	50	76	76	420											
AO85165-1	96	57	49	83	94	84	78	330	83	-	90	77	95	87	83	85	80	85	464											
CO85026-4	90	52	65	83	87	82	77	232	87	89	84	75	94	85	87	83	83	85	361											
TX1229-2Ru	92	79	95	91	97	82	88	291	91	90	82	77	96	91	76	84	72	84	403											
TX1385-12Ru	-	82	55	87	90	87	81	352	84	91	89	81	-	85	85	48	82	81	444											
TXAV657-27Ru	84	63	66	79	84	84	78	319	79	90	85	74	94	90	87	78	76	84	488											
TXNS112	-	72	32	79	89	78	71	289	82	90	81	78	94	72	84	79	79	82	401											
TXNS278	-	68	41	76	87	78	71	267	83	91	79	78	89	74	78	65	79	80	381											
SHEPODY	72	76	-	89	-	75	77	308	-	-	-	-	-	-	-	-	-	-	-											
ATX84706-2Ru	84	74	65	94	94	79	81	278	-	-	-	-	-	-	-	-	-	-	-											
Location means	88	64	49	81	87	79	75	285	81	89	81	70	91	78	80	69	75	79	397											

Western Table 4. 1996 U.S. No. 1's over 12 oz, percent of total yield for locations; percent and cwt/acre for Means; early and late harvest.

Entry	Early Harvest										Late Harvest										
	Calif		Idaho	NMex	Oregon	Texas	Wash		Mean		Calif		Idaho	NMex		Oregon		Wash		Mean	
	Krn	Kim					Clv	Hrm	Spr	Oth	%	wt/A		Tul	Slv	Colo	Ab	Kim	Frm	1"	Hrm
RUSSET BURBANK	8	0	0	7	27	7	8	33	34	23	15	1	31	18	7	5	17	17	91		
RANGER RUSSET	37	6	8	15	32	29	21	78	22	33	26	18	5	33	9	25	52	25	144		
RUSSET NORKOTAH	20	1	14	8	24	1	11	33	13	34	10	7	7	7	8	24	47	17	80		
A82360-7	-	-	-	-	-	-	-	-	13	-	27	0	5	-	4	8	32	13	74		
A84118-3	-	-	-	-	-	-	-	-	14	-	12	0	13	14	4	6	20	10	49		
A86102-6	9	0	10	21	21	24	14	68	41	-	28	2	21	20	12	14	36	22	125		
A8792-1	30	1	4	17	43	19	19	75	43	-	33	5	24	48	17	22	41	29	174		
AO85165-1	34	0	13	21	53	14	23	98	24	-	32	2	30	51	21	25	40	28	172		
CO85026-4	11	0	25	14	40	30	20	58	25	41	10	1	31	40	19	25	63	28	147		
TX1229-2Ru	25	8	34	44	80	61	42	153	48	52	53	20	71	60	44	55	60	51	254		
TX1385-12Ru	-	15	24	26	62	52	36	161	35	35	38	29	-	49	23	32	71	39	242		
TXAV657-27Ru	52	5	25	29	25	22	26	117	30	46	40	6	39	63	26	39	56	38	248		
TXNS112	-	8	10	10	29	11	14	53	23	43	11	6	8	21	17	40	42	23	127		
TXNS278	-	5	9	13	22	7	11	43	23	50	16	7	12	17	13	28	47	24	122		
SHEPODY	39	13	-	35	-	43	33	130	-	-	-	-	-	-	-	-	-	-	-		
ATX84706-2Ru	57	9	29	52	70	55	45	153	-	-	-	-	-	-	-	-	-	-	-		
Location means	29	5	16	22	41	27	23	90	28	40	25	7	23	34	16	25	45	26	146		

1/ U.S. No. 1's over 3".

Western Table 5. 1996 Specific gravity of tubers; early and late harvest .

Entry	Early Harvest							Late Harvest								
	Calif	Idaho	Oregon	Texas	Wash	Calif	Colo	Idaho	NMex	Oregon	Calif	Colo	Idaho	NMex	Oregon	
	Krn	Kim	Hrm	Spr	Oth	Mean	Tul	Slv	Ab	Kim	Frm	Hrm	Kim	Mal	Oth	Mean
RUSSET BURBANK	1.089	1.073	1.083	1.074	1.086	1.081	1.079	1.080	1.085	1.083	1.079	1.082	1.083	1.075	1.078	1.080
RANGER RUSSET	1.094	1.078	1.085	1.066	1.090	1.083	1.063	1.082	1.089	1.085	1.095	1.086	1.084	1.086	1.078	1.083
RUSSET NORKOTAH	1.088	1.081	1.070	1.058	1.078	1.075	1.072	1.073	1.080	1.081	1.077	1.068	1.065	1.068	1.069	1.073
A82360-7	-	-	-	-	-	-	1.071	-	1.089	1.081	1.084	-	1.090	1.094	1.078	1.084
A84118-3	-	-	-	-	-	-	1.065	-	1.089	1.087	1.099	1.086	1.088	1.087	1.086	1.086
A86102-6	1.099	1.074	1.086	1.071	1.084	1.083	1.072	-	1.082	1.088	1.094	1.081	1.082	1.089	1.077	1.083
A8792-1	1.103	1.076	1.091	1.074	1.091	1.087	1.066	-	1.090	1.090	1.091	1.086	1.087	1.089	1.079	1.085
AO85165-1	1.087	1.070	1.075	1.081	1.081	1.079	1.074	-	1.080	1.079	1.087	1.075	1.078	1.075	1.066	1.077
CO85026-4	1.094	1.073	1.080	1.074	1.087	1.082	1.065	1.075	1.085	1.082	1.092	1.079	1.084	1.085	1.072	1.080
TX1229-2Ru	1.086	1.079	1.076	1.066	1.081	1.078	1.068	1.084	1.077	1.082	1.082	1.077	1.069	1.077	1.071	1.076
TX1385-12Ru	-	1.079	1.077	1.067	1.089	1.078	-	1.081	1.086	1.086	-	1.077	1.079	1.084	1.074	1.081
TXAV657-27Ru	1.091	1.080	1.079	1.068	1.085	1.081	1.065	1.089	1.085	1.087	1.082	1.075	1.079	1.082	1.071	1.079
TXNS112	-	1.080	1.074	1.061	1.081	1.074	1.076	1.073	1.079	1.084	1.079	1.073	1.067	1.073	1.068	1.075
TXNS278	-	1.080	1.072	1.064	1.082	1.075	1.071	1.072	1.077	1.084	1.079	1.073	1.070	1.068	1.067	1.073
SHEPODY	1.092	1.072	1.074	-	1.085	1.081	-	-	-	-	-	-	-	-	-	-
ATX84706-2Ru	1.081	1.078	1.074	1.065	1.080	1.076	-	-	-	-	-	-	-	-	-	-
Location Means	1.091	1.077	1.078	1.068	1.084	1.079	1.070	1.079	1.084	1.084	1.086	1.078	1.079	1.081	1.074	1.080

Western Table 6. 1996 External and internal defects, french fry color, sugar ends, dextrose, vitamin C, and glycoalkaloids.

(U.S. No.2)													
Entry	& Culls		Culls <4 oz %	Growth Cracks (7 loc) ^{2/}	Shatter Bruise (5 loc)	Hollow Heart %	Black- Spot (5 loc) ^{4/}	French Fry Color ^{5/}	Sugar Ends % ^{6/}	Dextrose		Vit.C Mg/100g FWB ^{7/}	Glyco- alkaloids mg/100FWB ^{7/}
	>4 oz %									YSI	% DWB ^{7/}		
RUSSET BURBANK	18.6	15.8	3.7	4.7	16	3.8	1.5	9	0.10	18.3	3.0		
RANGER RUSSET	12.4	9.9	4.4	4.7	1	3.6	1.2	12	0.20	32.7	3.6		
RUSSET NORKOTAH	3.9	16.8	5.0	4.8	1	3.8	2.3	18	0.20	22.8	1.9		
A82360-7	9.7	18.3	4.4	4.2	1	4.0	0.8	7	0.12	18.5	2.1		
A84118-3	5.1	21.4	4.8	4.3	4	4.2	0.9	9	0.08	18.8	4.2		
A86102-6	18.1	11.6	3.5	4.5	5	4.3	1.9	11	0.14	20.2	1.4		
A8792-1	18.4	7.6	3.3	4.2	7	4.1	0.9	3	0.15	15.9	0.5		
AO85165-1	6.1	9.8	4.9	4.8	5	3.8	1.9	14	0.18	18.6	1.7		
CO85026-4	6.6	9.0	4.7	3.9	1	4.2	2.1	36	0.16	17.9	1.3		
TX1229-2Ru	13.9	3.3	3.3	3.5	9	2.9	1.2	7	0.09	21.5	13.2		
TX1385-12Ru	11.3	7.9	5.0	4.0	4	4.4	0.6	3	0.05	21.3	5.6		
TXAV657-27Ru	7.3	9.8	4.5	4.2	4	3.8	1.3	19	0.11	19.3	3.7		
TXNS112	5.5	13.6	5.0	4.7	5	3.8	2.6	19	0.25	20.8	2.1		
TXNS278	7.6	13.6	4.9	4.6	4	4.0	2.5	18	0.22	21.6	2.8		
SHEPODY	14.0	8.0	5.0	5.0	0	4.5	3.0	0	-	-	-		
ATX84706-2Ru	13.3	5.3	3.7	2.8	14	3.8	-	0	-	-	-		
Means	10.7	11.3	4.4	4.3	5	3.9	1.6	12	0.15	20.6	3.4		

^{1/} Firm omitted. Late Harvest, eight locations.^{2/} 5.0 (none) to 1.0 (severe).^{3/} Mean of 9 locations including Early Harvest, >12 oz. tubers; includes brown center.^{4/} Mean of 5 locations, (3 loc. for Shepody, 1 loc. for ATX84706-2Ru), 1.0 (darkest) to 5.0 (lightest).^{5/} Mean of 5 locations (Slv, Ab, Hrm, Kim, Klm), out of 45 F storage, <1.0 (lightest) to 4.0 (darkest).^{6/} Mean of 5 locations (Ab, Kim, Hrm, Klm, Mall).^{7/} Aberdeen tubers only, sampled late October; DWB = dry weight basis; FWB = fresh weight basis.

Western Table 7. 1996 Merit scores, processing and fresh market, and disposition.

Entry	Merit Score: Processing				Merit Scores: Fresh Market						1/ Mean	Disposition
	Idaho		Oregon		Calif 2/	Idaho		Oregon		Texas Spr		
	3/ SLV	2/	Hrm	Mean		3/ SLV	2/	Hrm	Mean			
RUSSET BURBANK	4.0	3.0	3.0	3.3	2.9	4.0	2.0	2.0	2.8	2.7	CHECK	
RANGER RUSSET	5.0	4.1	5.0	4.7	2.7	5.0	3.1	3.0	3.5	3.5	CHECK	
RUSSET NORKOTAH	1.0	3.0	1.0	1.7	4.0	1.0	3.7	3.0	3.0	2.9	CHECK	
A82360-7	-	4.1	-	4.1	2.0	-	3.5	-	-	2.8	CONT	
A84118-3	-	4.4	4.0	4.2	3.7	-	3.7	4.0	-	3.8	RTC	
A86102-6	-	3.5	1.0	2.3	3.6	-	2.7	1.0	3.5	2.7	DROP	
A8792-1	-	3.8	4.0	3.9	3.5	-	3.1	4.0	3.5	3.5	CONT	
AO85165-1	-	2.7	2.0	2.3	3.6	-	3.5	4.0	4.5	3.9	RTC	
CO85026-4	1.0	3.4	1.0	1.8	3.8	1.0	2.9	4.0	3.8	3.1	CONT	
TX1229-2Ru	2.0	3.6	1.0	2.2	3.1	2.0	2.6	2.0	3.8	2.7	RTC	
TX1385-12Ru	3.0	4.0	3.0	3.3	2.0	2.0	2.8	3.0	4.0	2.8	CONT	
TXAV657-27Ru	5.0	3.7	1.0	3.2	3.4	5.0	3.3	3.0	3.8	3.7	CONT	
TXNS112	1.0	3.3	2.0	2.1	4.0	4.0	4.5	3.0	3.8	3.9	CONT	
TXNS278	1.0	3.0	2.0	2.0	4.3	3.0	4.1	3.0	3.5	3.6	CONT	
SHEPODY	3.0	3.8	-	3.4	2.7	4.0	3.3	-	-	3.3	CHECK	
ATX84706-2Ru	-	4.3	-	4.3	2.0	-	2.5	-	3.8	2.8	DROP	
Means	2.6	3.6	2.3	2.8	3.2	3.1	3.2	3.0	3.6	3.2		

^{1/} 1.0 (poorest) to 5.0 (best).

^{2/} Composite scores for Ab & Kim, and for Krn & Tul early and late trials.

^{3/} RTC = regional testing completed (3 yrs), CONT = continue in trial, DROP = drop from trial, CHECK = control.

COLORADO

D. G. Holm and J. D. Wick¹

Objectives

The major objectives of the Colorado breeding program are: (1) to develop new potato cultivars (russets, chippers, and reds) with increased yield, improved processing and fresh market quality, resistance to diseases and pests, and tolerance to environmental stresses; (2) to provide a basic seed source of selections for possible seed export.

Breeding Program

Fifty-four parental clones were intercrossed in 1996. Seeds from 339 combinations were obtained. Seedlings from selected families will be produced in 1997 for field selection in 1998.

An additional 27 parental clones were intercrossed in early 1997. Primary emphasis was placed on developing russet germplasm with cold processing characteristics. Ten processing russets and 17 chippers possessing "cold" chipping characteristics were utilized. Seedlings from these crosses will also be produced in 1997 for field selection in 1998.

One hundred four families from 1995 crosses were grown in the greenhouse producing 41,119 seedling tubers for initial field selection in 1997. Surplus tubers (second through fourth sizes) will be distributed to Idaho, Minnesota, Oregon, Texas, and Alberta, Canada.

A second, smaller planting of seedlings was grown from families developed for germplasm with early blight, late blight, and soft rot resistance and will be field grown in 1997. These seedlings were derived from crosses of advanced selections and cultivars with somatic hybrids of *Solanum* species and *Solanum tuberosum* from Dr. John Helgeson.

Seedling tubers were obtained from Dr. J. J. Pavsek, USDA-ARS, Aberdeen, Idaho; ; Dr. Dermot Lynch, Agriculture Canada, Lethbridge, Alberta;

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and Dr. Richard Novy, North Dakota State University, Fargo, North Dakota.

Selection Program.

A total of 76,272 first-year seedlings were planted with 693 being selected at harvest for further observation. Another 946 clones were in 12-hill, preliminary, and intermediate stages of selection. Of these, 267 were saved at harvest for further evaluation. Thirty advanced selections were saved and contingent on additional evaluations will be increased in 1997. Another 163 selections were maintained for germplasm development, breeding, or other experimental purposes.

Advanced Yield Trial. Twenty-seven clones, 24 advanced selections and 3 cultivars, were evaluated in the Advanced Yield Trial. Results on yield, grade, and processing characteristics are summarized in Tables 1 and 2. All advanced selections, except CO81082-1 and NDTX3773-1RU, had greater total and US #1 yields than Centennial Russet and Russet Norkotah.

Selections with processing potential were AC78069-17, AC82363-3, AC83064-6, AC87084-3, AC87138-4, AC88042-1, AC89047-1, CO87009-4, CO89037-7, COO83008-1, and TC1406-1.

Two russets selections, AC87084-3 and CO87009-4, will be entered in the 1997 Western Regional Main Trials. Seed of these selections will also be allocated for grower trials in 1997.

Western Regional Main Trial. Six selections and six cultivars were grown in the Western Regional Trial.

The number of entries in this trial was significantly reduced from 1995. This is due to excluding all entries coming from areas where seed stocks potentially have been exposed to late blight. We are attempting to initiate tissue culture based increases of all potential entries from the various cooperating programs two years in advance of entrance in the Western Regional Trials (Main, Chip, and Red). This would allow our program to have suitable stocks ready for trials in the event they are entered in the Western Regional Trials.

The only selection entered by Colorado in 1996 was CO85026-4. Of the new entries in 1996, two were Russet Norkotah line selections from Texas.

Several selections had excellent yield and grade. Both of the Texas Russet Norkotah line selections had significantly greater total and US #1 yields than the standard.

Selections with acceptable fry scores were TX1229-2RU, TX1385-12RU, and TXAV657-27.

Colorado will enter Russet Norkotah-Selection 3 and Russet Norkotah-Selection 8 in 1997 Western Regional Main Trial.

Results of this trial are presented in the Western Regional Trial report elsewhere in this publication.

Western Regional and Advanced Chipping Trial.

The Colorado Western Regional Chip Trial also included intermediate and advanced chipping selections from our program that were not formally entered into the regional trials. Trial results are presented in Tables 3 and 4.

BC0894-2 completed three years of evaluation in 1996. This selection is early maturing and continues to show potential for release. BC0894-2 was also entered into the Snack Food Association (SFA) Trials in 1995-1996 and will be evaluated again in 1997. Another selection showing considerable potential is ATX85404-8. It will be entered in the SFA Trials for the second year in 1997.

Selection AC88357-3 will be entered in the 1997 Western Regional Chip Trials.

Western Regional and Advanced Red Trial. This was the fourth year for a formalized Western Regional Red Trial. The Colorado Western Regional Red Trial also included red selections from our program that were not formally entered into the regional trials. Trial results are summarized in Table 5.

Two red selections from Colorado, CO86142-3 and CO86218-2, graduated from the Western Regional Red Trial after three years of evaluation. DT6063-1R will be entered again into the 1997 Western Regional Red Trials.

Included in the trial in 1996 were three specialty selections. NDC4069-4 is a red-fleshed selection. RC92003-2 and RC92003-3 are purple-fleshed selections.

Grower Evaluations. Grower evaluations were conducted on seven russets (AC78069-17, AC83064-1, AC83064-6, CO80011-5, CO81082-1, CO82142-4, and CO86026-4). Selection CO82142-4 was discarded from further evaluation. Growers recommended naming CO80011-5 (Crestone Russet) and AC78069-17, AC83064-1, and AC83064-6. Selection CO81082-1 will be evaluated another year prior to making any final determination on naming. CO85026-4 will be evaluated by growers for a third year in 1997.

Two chipping selections (ATX85404-8 and BC0894-2) and two red selections (CO86142-3 and CO86218-2) were released for initial grower evaluations in 1996. All selections will be evaluated by growers for a second year in 1997. Two new russet selections, AC87084-3 and CO87009-4 will be released for grower trials in 1997. Data on these and other advanced selections are summarized in Table 6.

COO83008-1 will likely be named in 1997. This will be a joint release by Oregon, Colorado, Idaho, and Washington Agricultural Experiment Stations. The cross for this selection was made in Colorado and selected in Oregon. This selection has excellent processing qualities.

Colorado Table 1. Yield, grade, tuber shape, and skin type for Advanced Yield Trial clones - 1996.

Clone	Yield (Cwt/A)					Tuber Shape ¹ & Skin Type
	Total	US #1				
		Total	%	> 10 oz	< 4 oz	
AC78069-17	503	445	88.6	244	29	Ob,Ru
AC82363-3	504	441	87.4	159	47	Ob,Ru
AC83064-1	569	507	89.1	167	51	Ob,Ru
AC83064-6	439	389	88.6	188	43	L,Ru
AC84437-2	534	496	92.7	271	24	Ob,Ru
AC87079-3	509	448	88.0	162	52	Ob,Ru
AC87084-3	563	530	94.1	218	30	Ob,Ru
AC87138-4	555	496	89.0	188	47	L,Ru
AC87210-2	409	343	83.7	111	42	L,Ru
AC88042-1	409	348	85.2	93	54	L,Ru
AC88162-4	442	390	88.4	206	37	L,Ru
AC88165-3	475	361	75.8	76	111	L,Ru
AC89047-1	445	332	74.8	82	110	L,Ru
CO80011-5	480	434	90.4	199	37	Ob,Ru
CO81082-1	357	309	86.6	106	44	L,Ru
CO82142-4	414	381	92.1	230	23	L,Ru
CO87009-4	470	360	76.7	57	107	L,Ru
CO89036-10	547	469	85.8	180	65	Ob,Ru
CO89037-7	411	365	88.6	120	44	Ob,Ru
COO83008-1	483	450	93.1	312	17	L,Ru
NDTX3773-1RU	393	292	74.3	53	97	Ob,Ru
TC1406-1	462	394	85.2	182	55	Ob,Ru
TC1412-5	439	387	88.2	152	34	Ob,Ru
TX1216-1RU	383	284	74.3	28	93	Ob,Ru
Centennial Russet	275	226	82.2	20	48	Ob,Ru
Russet Norkotah	372	327	88.0	118	42	L,Ru
Russet Nugget	454	402	88.5	173	47	Ob,Ru
Mean	455	393	85.9	152	53	----
LSD ² (0.05)	48	51	4.6	49	17	----

¹Tuber shape & skin type: Ob=oblong; L=long; Ru=russet.

²LSD=least significant difference.

Colorado Table 2. Specific gravity, french fry color, and texture for Advanced Yield Trial clones - 1996.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	3 wks 50F + 8 wks 45F	At Harvest	3 wks 50F + 8 wks 45F
AC78069-17	1.082	2	2	4	5
AC82363-3	1.097	2	2	3	3
AC83064-1	1.080	4	4	3	3
AC83064-6	1.080	2	1	3	3
AC84437-2	1.091	3	3	3	3
AC87079-3	1.093	2	3	4	3
AC87084-3	1.093	2	2	4	4
AC87138-4	1.083	1	1	1	2
AC87210-2	1.065	3	3	2	3
AC88042-1	1.078	2	2	2	2
AC88162-4	1.090	3	4	3	3
AC88165-3	1.076	3	3	3	3
AC89047-1	1.089	2	2	3	3
CO80011-5	1.068	3	2	2	2
CO81082-1	1.074	5	4	2	2
CO82142-4	1.084	4	4	3	2
CO87009-4	1.098	1	1	4	3
CO89036-10	1.084	3	3	3	3
CO89037-7	1.076	2	2	2	2
COO83008-1	1.087	1	2	4	3
NDTX3773-1RU	1.076	3	4	2	2
TC1406-1	1.083	1	1	3	4
TC1412-5	1.098	3	2	2	3
TX1216-1RU	1.074	4	3	3	3
Centennial Russet	1.078	4	4	2	2
Russet Norkotah	1.070	2	2	2	3
Russet Nugget	1.091	2	3	4	4

¹Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry, with 1 representing a soggy, wet texture.

Colorado Table 3. Yield, grade, tuber shape, and skin type for Western Regional and Advanced Chipping Trial clones - 1996.

Clone	Yield (Cwt/A)					Tuber Shape ¹ & Skin Type
	Total	US #1			< 4 oz	
		Total	%	> 10 oz		
AC87313-3	512	450	87.8	126	57	R,W
AC87340-2	492	406	82.6	87	84	R,W
AC88357-3	414	361	87.1	107	48	R,W
AC89653-3	532	438	82.2	65	89	R,W
AC90450-3	489	405	82.8	105	82	R,W
AC90450-6	386	282	73.1	30	96	R,W
AC90467-3	503	422	83.8	122	78	R,W
ATX85404-8	567	459	80.8	145	97	R,W
BC0894-2	467	403	86.3	129	61	R,W
CO87106-5	484	388	80.2	71	91	R,W
CO90029-3	508	421	82.6	94	77	R,W
CO90215-2	521	444	85.2	178	42	R,W
CO90218-1	392	338	86.8	117	29	R,W
NDC4327-2	535	433	81.0	65	93	R,W
NDC4661-2	397	299	75.1	34	98	R,W
NDC4765-2	406	333	82.1	63	69	R,W
Atlantic	472	426	90.3	172	38	R,W
Chipeta	626	566	90.4	388	22	R,W
Mean	484	404	83.3	117	69	---
LSD ² (0.05)	47	49	4.8	40	19	---

¹Tuber shape & skin type: Ov=oval; R=round; W=white.

²LSD=least significant difference.

Colorado Table 4. Chip color¹ after various storage regimes and specific gravity of Western Regional and Advanced Chipping Trial clones - 1996.

Clone	Specific Gravity	6 wks 40F	6 wks/40F + 3 wks/60F	6 wks 50F	6 wks/50F + 3 wks/60F
AC87313-3	1.090	2.5	2.5	2.0	1.0
AC87340-2	1.078	3.0	2.5	1.5	1.0
AC88357-3	1.086	3.5	3.0	1.0	1.5
AC89653-3	1.085	3.5	3.5	2.0	2.0
AC90450-3	1.090	3.0	2.0	1.5	1.5
AC90450-6	1.084	3.5	3.0	1.5	1.5
AC90467-3	1.084	4.0	3.0	2.0	2.0
ATX85404-8	1.089	2.5	3.5	2.0	2.0
BC0894-2	1.082	2.5	1.5	1.0	1.0
CO87106-5	1.090	3.0	2.5	1.0	2.5
CO90029-3	1.087	3.0	3.0	1.5	2.0
CO90215-2	1.082	3.0	2.5	1.5	2.0
CO90218-1	1.073	3.5	3.5	2.0	2.0
NDC4327-2	1.079	3.0	3.0	2.5	1.0
NDC4661-2	1.087	3.5	2.5	2.0	1.5
NDC4765-2	1.073	3.0	2.0	2.5	1.0
Atlantic	1.090	2.5	2.0	2.5	1.5
Chipeta	1.085	3.5	3.0	2.5	1.5

¹Chip color was rated using the Snack Food Association 1-5 scale. Ratings of ≤ 2.0 are acceptable.

Colorado Table 5. Yield, grade, tuber shape, and skin type for Western Regional and Advanced Red Trial clones - 1996.

Clone	Yield (Cwt/A)					Tuber Shape ¹ & Skin Type
	Total	US #1			< 4 oz	
		Total	%	> 10 oz		
CO86142-3	458	379	82.5	62	67	R,R
CO86218-2	499	437	87.6	189	57	R,R
CO89097-2	581	527	90.7	249	46	Ov,R
DT6063-1R	510	455	89.2	192	43	Ob,R
NDC4069-4	614	494	80.2	141	117	R,R
NDC4655-1	398	310	77.6	77	84	R,R
NDTX8-731-1R	488	427	87.6	229	49	R,R
RC92003-2	374	237	63.3	16	137	Ob,P
RC92003-3	442	336	76.1	90	100	Ob,P
Norland (Dark Red)	387	299	77.2	46	85	R,R
Red LaSoda	562	488	87.0	267	39	Ov,R
Sangre-10	536	497	92.8	319	34	Ov,R
Mean	487	407	82.6	156	72	---
LSD ² (0.05)	53	56	4.5	51	16	---

¹Tuber shape & skin type: R=round; Ov=oval; Ob=oblong; R=red; P=purple.

²LSD=least significant difference.

Colorado Table 6. Summary comparison of advanced selections and named cultivars for yield, grade, maturity, specific gravity, and grade defects - 1996.

Clone	Usage ¹	Loc x Years	Total Yield (Cwt/A)	% US #1	Vine Maturity ²	Specific Gravity	% External Defects ³	% Hollow Heart ⁴
Russets								
CO80011-5	FM	11	392	84.2	2.4	1.071	2.8	0.0
AC78069-17	FM/Fry	10	417	88.3	3.4	1.084	4.5	0.3
CO81082-1	FM	10	337	85.5	2.2	1.075	0.7	0.4
AC83064-1	FM	8	470	88.5	3.1	1.078	1.5	0.0
AC83064-6	FM/Fry	8	390	86.7	3.1	1.079	1.0	0.1
CO85026-4	FM	6	365	89.6	3.7	1.082	3.0	0.0
AC87084-3	FM/Fry	4	517	91.5	3.6	1.092	2.0	0.0
CO87009-4	FM/Fry	4	409	75.3	2.8	1.093	0.8	0.4
Centennial Russet	FM	32	287	77.8	3.0	1.081	0.9	0.4
Russet Norkotah	FM	19	299	83.6	1.4	1.075	1.7	0.1
Russet Nugget	FM/Fry	22	413	82.4	3.9	1.095	1.6	0.1
Chippers								
ATX85404-8	Chip	5	475	75.4	3.0	1.089	1.0	0.2
BC0894-2	Chip	5	394	85.0	1.7	1.079	0.6	0.0
Atlantic	Chip	10	413	87.2	3.3	1.097	1.6	1.9
Chipeta	Chip	11	481	84.4	3.4	1.091	3.2	0.4
Reds								
CO86142-3	FM	5	369	80.7	1.1	1.076	1.6	0.1
CO86218-2	FM	5	389	82.1	2.9	1.074	1.0	0.0
DT6063-1R	FM	3	439	88.1	2.7	1.079	2.3	0.6
Sangre	FM	14	431	85.4	2.8	1.074	0.8	0.2

¹FM=fresh market; Fry=french fry; FM/Fry indicates a dual purpose clone.

²Vine maturity: 1=very early; 2=early; 3=medium; 4=late; 5=very late.

³Includes defects such as growth crack, second growth, misshapen, and green.

⁴Based on tubers greater than 10 ounces.

FLORIDA

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CORKY RINGSPOT RESISTANCE EXPERIMENT, 1996.

The crop was planted on 15 February 1996 and harvested on 5 June 1996. The crop was fertilized with 1200 lbs. 14:2:12 on 15 February and side dressed with 700 lbs. 14:2:12 on 5 March. Metribuzin (Sencor® 75DF), 1.25 lb/acre was applied for weed control on 5 March. Weekly applications of chlorothalonil (Bravo® 720) or mancozeb (Dithane® M45 or Manzate® 200) were made for disease control. A randomized block design with four replications was used. Five hills per plot were planted with a 12 in. spacing between hills. Standards were Red LaSoda (susceptible), Superior (resistant), and Kennebec (susceptible).

All tubers >1.5" diameter were cut into eighths and scored for CRS. 0-8=no. of tuber sections with internal or external CRS symptoms; 9=25-50% cut surface affected and 10=50-100% cut surface affected. Data are presented as the number of tubers with internal and external symptoms, percentage tubers with external and internal symptoms, severity averaged across all tubers, and severity averaged across only those tubers with symptoms.

Corky ringspot incidence was moderate to high in the experiment with >23% of the tubers of the susceptible controls (Red LaSoda and Kennebec) having symptoms of the disease. As expected, there was a wide range in disease incidence among the seedlings. Incidence in the seedlings varied from 0% in several to >40% in B1176-70. AF1481-4 and AF1609-1 may have tolerance to CRS and should be tested further.

Florida Table 1. Percent corky ringspot infected tubers and severity rating.

Seedling, or Variety	% Tubers	Internal CRS ^{1,2}		
		Sum Severity Ratings	Average Severity	
			All Tubers	Infected Tubers
AF1433-4	20.1b	33b-d	0.8cd	2.9bc
AF1481-4	0.0c	0d	0.0e	0.0e
AF1609-1	0.0c	0d	0.0e	0.0e
SC8801-2	4.8c	3d	0.1e	1.0de
B1136-1	2.1c	3d	0.1e	1.8cd
B1136-3	2.4c	1d	0.0e	0.8de
B1136-6	1.5c	1d	0.0e	0.8de
B1136-12	7.2c	5d	0.2e	1.2de
B1136-20	0.0c	0d	0.0e	0.0e
B1136-23	0.7c	1d	0.0e	0.5de
B1136-29	0.0c	0d	0.0e	0.0e
B1136-31	13.6bc	12cd	0.4de	1.8cd
B1136-32	0.0c	0d	0.0e	0.0e
B1136-34	2.1c	1d	0.0e	1.0de
B1136-45	1.3c	1d	0.0e	0.5de
B1136-48	0.0c	0d	0.0e	0.0e
B1136-50	2.3c	3d	0.1e	0.8de
B1136-54	0.0c	0d	0.0e	0.0e
B1136-60	0.0c	0d	0.0e	0.0e
B1136-70	0.0c	0d	0.0e	0.0e
B1176-4	25.9b	25b-d	1.0bc	4.2ab
B1176-7	4.2c	3d	0.1e	0.5de
B1176-22	0.0c	0d	0.0e	0.0e
B1176-36	0.0c	0d	0.0e	0.0e
B1176-46	4.7c	4d	0.1e	1.8cd
B1176-47	1.5c	1d	0.0e	0.4de
B1176-50	0.0c	0d	0.0e	0.0e
B1176-70	40.9a	135a	2.1a	4.8a
B1176-80	37.8a	54b	1.5b	3.5ab
B1176-84	0.0c	0d	0.0e	0.0e
B1176-91	0.5c	0d	0.0e	0.3de
Red LaSoda	23.4b	44bc	1.0bc	3.3bc
Superior	0.0c	0d	0.0e	0.0e
Kennebec	23.1b	30b-d	0.8cd	3.1bc

¹Values within a column followed by the same letter do not differ significantly (P=0.05) according to Duncan's Multiple Range Test.

²Severity rated as follows: 0-8=number of tuber sections with symptoms; 9=<25% surface area affected; 10=>25% surface area affected.

Florida Table 2. Percent corky ringspot infected tubers and severity rating.

Seedling, or Variety	% Tubers	External CRS ^{1,2}		
		Sum Severity Ratings	Average Severity	
			All Tubers	Infected Tubers
AF1433-4	34.7a	56a	1.4a	3.0a
AF1481-4	0.0c	0d	0.0d	0.0c
AF1609-1	0.0c	0d	0.0d	0.0c
SC8801-2	1.0c	1d	0.0d	0.5c
B1136-1	1.0c	1d	0.0d	0.5c
B1136-3	0.0c	0d	0.0d	0.0c
B1136-6	0.0c	0d	0.0d	0.0c
B1136-12	0.0c	0d	0.0d	0.0c
B1136-20	0.0c	0d	0.0d	0.0c
B1136-23	1.8c	1d	0.0d	0.5c
B1136-29	0.0c	0d	0.0d	0.0c
B1136-31	0.0c	0d	0.0d	0.0c
B1136-32	0.0c	0d	0.0d	0.0c
B1136-34	0.0c	0d	0.0d	0.0c
B1136-45	0.0c	0d	0.0d	0.0c
B1136-48	0.0c	0d	0.0d	0.0c
B1136-50	0.9c	1d	0.0d	0.5c
B1136-54	0.0c	0d	0.0d	0.0c
B1136-60	0.8c	0d	0.0d	0.3c
B1136-70	0.0c	0d	0.0d	0.0c
B1176-4	10.7bc	7d	0.2d	2.5ab
B1176-7	4.2c	3d	0.1d	0.5c
B1176-22	0.0c	0d	0.0d	0.0c
B1176-36	0.0c	0d	0.0d	0.0c
B1176-46	0.9c	0d	0.0d	0.3c
B1176-47	1.5c	1d	0.0d	0.3c
B1176-50	0.0c	0d	0.0d	0.0c
B1176-70	32.2a	54ab	0.9bc	2.4ab
B1176-80	32.4a	37bc	1.1ab	2.5ab
B1176-84	0.0c	0d	0.0d	0.0c
B1176-91	0.9c	1d	0.0d	0.4c
Red LaSoda	18.1b	22cd	0.5cd	1.7b
Superior	0.0c	0d	0.0d	0.0c
Kennebec	6.2c	3d	0.1d	0.6c

¹Values within a column followed by the same letter do not differ significantly (P=0.05) according to Duncan's Multiple Range Test.

²Severity rated as follows: 0-8=number of tuber sections with symptoms; 9=<25% surface area affected; 10=>25% surface area affected.

Idaho

S. Love, J. Pavék, D. Corsini, P. Bain, M. Ruby, J. Stimpson, D. Inglis, and M. Powelson

A major objective of the Idaho potato variety development project is to evaluate germplasm produced by the USDA/ARS potato breeding program located in Aberdeen, Idaho. These evaluations include variety trials, herbicide screening, culinary tests, and disease screening. The major emphasis is placed on developing long shaped, russet skinned varieties which have superior fresh market and french fry processing (dual purpose) quality. Some effort is also spent developing chipping varieties.

Replicated Variety Trials

Eight potato variety trials were conducted in 1996 at Rexburg, Shelley, Aberdeen, and Parma, Idaho. Rexburg is located in the high elevation area of eastern Idaho and has the coolest, shortest season (120 days) of the four sites. Shelley and Aberdeen are located along the Snake River in eastern Idaho, are slightly warmer, and have a 130 day season. Parma is located in the warmer area of western Idaho and has a 160 day season. Trials in Aberdeen and Parma were located on experiment stations, while the trials in Rexburg and Shelley were placed in growers fields. All trial sites were located within major potato production areas.

The trials were planted between April 10 and May 14 and harvested between September 16 and October 4. Crop management practices were typical of those used in the same regions. All trials were planted using a randomized complete block design with either four or six replications. Plots consisted of single rows, twenty feet long.

Following harvest the potatoes were weighed, graded, and sampled for internal quality evaluations. Depending on the specific objectives of the trial, samples were taken for evaluation of blackspot and shatter bruise susceptibility, presence of internal defects, specific gravity, french fry color, and dry matter yield.

Five of the eight trials were conducted to evaluate dual purpose russet or long-white, processing selections (Tables 1, 4, 6, 7, 8). Two were conducted to evaluate chipping selections (Tables 3, 5). One was designed to evaluate

selections for high dry matter yield for dehydration purposes (Table 2).

Advanced russet selections, including clones in their fifth to fourteenth year of evaluation, were grown at Aberdeen (Table 1). Of the seventeen entries in the trial, nine had higher total yields than Russet Burbank. All entries had a higher percentage, and fourteen a higher yield, of U.S. No. 1's. Clones with good yields, specific gravities, fry color, and merit (appearance) scores included A8894-8, A88338-1, A89149-7, and A81386-1.

Every clone tested in the advanced high dry matter trial produced a substantially higher yield of dry matter than did Russet Burbank (Table 2). The superior dry matter yields were the result of a combination of high tuber yield and high tuber solids. The exceptional performers were A82360-7, A8787-2, and A8836-5.

In the chipping selection trials, several clones performed well with respect to yield, grade, specific gravity, and chip color (Tables 3, 4). These included A90450-16, A87109-10, A8961-14, NDO1496-1, NDA2031-2, A88431-1, and ATX85404-8. A87109-10 was found to have marginally high levels of tuber glycoalkaloids and subsequently dropped from further consideration.

Long russets were evaluated in four additional trials (Tables 5, 6, 7, 8). The most consistent performer for yield in these trials was A82360-7, an oblong, lightly russeted clone that was selected for dehydration purposes. Other selections with a combination of good yield and quality scores, in comparison with Russet Burbank, were AO87277-6, A81473-2, AO82611-7, and A8495-1. A8894-8 performed well in the Tri-State Trial (Table 5) but had very high levels of glycoalkaloids and was discarded.

Sensory Evaluations

Five advanced breeding selections were compared to Russet Burbank in blind sensory evaluations of baked tubers. The evaluations were conducted at the Bingham County Extension office by University of Idaho extension personnel. Tubers were baked in a convection oven, then rated by

trained panelists for color, texture, flavor, and overall quality. The evaluations were done twice, once within a month of harvest and again after five months of storage at 40°F.

In the fall evaluation, four of the five selections were similar to Russet Burbank for all categories except texture (Table 9). Russet Burbank had the highest texture rating of any clone in the trial. A8894-8 was inferior to all other clones in the test. It was rated lower than all other entries for every category.

After five months of storage, A8495-1 was the highest rated clone in all four sensory categories. Two clones had improved ratings compared to Russet Burbank. A8894-8 had the lowest evaluation in every category and worsened over time.

Metribuzin Screening

Six varieties and thirty-four breeding selections were tested for response to the herbicide metribuzin (Secor/Lexone). Estimations were made for percent foliar injury and measurements taken for vigor following a postemergence (8-10 inch plants) application of 1.0 lb a.i./A. Yield loss due to the application was predicted using a previously developed model which incorporates injury and vigor as inputs. Each variety or selection was assigned a relative resistance score based on yield loss in comparison with varieties of known response.

The known varieties responded in the expected fashion in 1996 (Table 10). Shepody was very susceptible, and most plants died resulting in a predicted yield loss of 100%. CalWhite and Atlantic were susceptible to injury, while Russet Burbank and Russet Norkotah were very resistant. Most of the russet and long-white selections were resistant or very resistant to injury. The one exception was A8894-8 which was moderately susceptible.

The chipping and red selections showed a mixed response. Of special note was one chipping selection from Texas, ATX85404-8, which was very susceptible to metribuzin injury. Four other chipping selections, A88356-1, A88431-1, BC0894-2, and NDA2031-2, and two red selections, AD82706-2R and CO86142-3, were moderately susceptible to injury.

Disease Screening

Potato varieties and selections were evaluated for response to several important diseases, including *Verticillium* wilt, early blight, common scab, soft rot, late blight, and leafroll induced net necrosis.

Verticillium wilt, early blight, common scab, and soft rot: Breeding selections and standard cultivars were evaluated for their reaction to diseases that commonly occur in Idaho. *Verticillium* wilt, early blight, and common scab evaluations were done in fields at the University of Idaho Research Center, Aberdeen. Soft rot evaluations were done by inoculating tuber samples harvested from one of the test sites in mid September using 10^6 cells/ml *Erwinia carotovora* var. *atroseptica*. Tubers were evaluated after 7 days incubation in a mist chamber at 20°C. The varieties Ranger Russet and Chipeta showed good *Verticillium* wilt resistance but not early blight resistance (Table 11). A number of the advanced breeding selections were resistant to *Verticillium* and moderately resistant to early blight. Of particular note is the resistance of A82360-7, a clone which is being considered for release as a variety. Most breeding selections were resistant to common scab except for 3 that were moderately susceptible. Selection A8894-8 showed exceptional soft rot resistance in this first year of testing. No late blight occurred in the plots.

Late blight: Arrangements were made to screen breeding material for late blight resistance in Corvallis, Oregon, and Mt. Vernon, Washington. The trials were conducted by Mary Powelson and Debra Inglis, respectively.

In both locations artificial inoculations were used to augment natural infection. Disease response was measured by monitoring disease progress and calculating Area Under Disease Progress Curve (AUDPC). At Mt. Vernon, the amount of tuber rot was also documented. Determinations of late blight strains were made at season's end. At Mt. Vernon the only strain found was US11 A1, while at Corvallis US8 A2 was present.

A wide range of responses to late blight were found among the clones in the trials (Tables 12, 13). All of the named varieties commonly grown in North America were very susceptible to foliar blight at both locations. At Mt. Vernon, three named varieties had good resistance. Brodick, Brador, and Bzura (Table 12). Other clones with good resistance

were A82360-7, AWN85510-2, A90586-11, AWN86514-2, AWN86524-5, G6582-3, and AWN85540-1. Some clones had poor to moderate resistance to foliar blight but exhibited very little tuber blight. These included Atlantic, Russet Burbank, A84118-3, AO87119-3, AO82611-7, A82705-1R, and COO83008-1. At Corvallis, clones with the best resistance to foliar blight were BO767-2, BO692-4, J101-K6-A22, BO718-3, G6582-3, J101-K9, A90586-11, AWN86514-2, AWN86524-5, and J101-K6.

Leafroll induced net necrosis: Advanced breeding selections and varieties were evaluated for tuber reaction to potato leafroll virus infection from 1987 to 1995 at the University of Idaho Research Center, Kimberly, Idaho. Green peach aphids were allowed to establish and spread naturally into test plots from adjacent leafroll-infected Russet Burbank spreader plants. Breeding selections, A81473-2 and A8495-1, and the variety Ranger Russet were tested from 6 to 9 years and showed almost no serious net necrosis defect (0.3-0.4%) and very little moderate defect (1.6-8.4%). AO82611-7 and A82360-7 were tested 3 years and 2 years, respectively, and showed no serious net necrosis symptoms (Table 14). These are comparable to Atlantic in resistance to leafroll net necrosis. The varieties CalWhite, Frontier Russet, and Shepody, and the breeding selections, A84118-3 and COO83008-1, were as susceptible or more susceptible than Russet Burbank to net necrosis symptoms.

Summary of Promising Breeding Selections

A81473-2: This oblong russet is a very late maturing clone that has performed best in the long season areas of western Idaho, Oregon, and Washington. It is the result of a cross between A75175-1 (Targhee x A67490-3) and A75188-3. A81473-2 outyielded Russet Burbank at Aberdeen, Parma, and Rexburg in 1996 (Tables 1, 6, 8). It also had a higher percentage of U.S. No. 1's and had similar quality scores. At Aberdeen and Rexburg, A81473-2 tended to have short tubers, and at all sites it produced an abundance of large tubers. Release procedures for A81473-2 will probably be initiated in late 1997. In 1996 there were 306 acres of seed produced.

A82360-7: This oval, lightly russeted clone was developed specifically for dehydration purposes and selected for maximum dry matter yield. It is the result of a cross between A77182-1 (Atlantic x

Lemhi Russet) and A75188-3. A82360-7 has shown potential for french fry production as well as dehydration. It was the highest yielder in every trial in 1996, except at Shelley, where it was second highest (Tables 2, 6, 7, 8). In the high dry matter trial at Aberdeen, it produced 156% of the dry matter of Russet Burbank. This clone will be included in the Western Regional Trial for one more year and then moved into commercial production trials.

A82705-1R: This red clone is a dark red, high yielding selection that has good storage characteristics. It is the result of a cross between Sangre and TXA218-7 (NDTX9580-6R x Viking). A82705-1R will likely be released in 1997 or 1998 under the name of IdaRose.

A8495-1: This long, russeted clone is not one of the higher yielding selections being tested but has excellent appearance and processing quality. It is the result of a cross between A77182-1 (Atlantic x Lemhi Russet) and Russet Norkotah. In 1996, A8495-1 had similar yield to Russet Burbank, with higher yields in Shelley and Rexburg, lower in Aberdeen and Parma (Tables 1, 6, 7, 8). In every trial, it had a higher percentage of U.S. No. 1's, higher specific gravity, and better fry color. In 1996 there were 97 acres of seed produced. A8495-1 will probably be released in 1998.

AO82611-7: This long, russeted clone is an Oregon selection of an Aberdeen seedling. It was the result of a cross between Butte and A77268-4 (Lemhi Russet x Norchip). Oregon is currently pursuing release of this clone. In 1996, AO82611-7 was only evaluated at Parma (Table 6), where it performed very well. It had high yield, good grade, high specific gravity, and showed some resistance to sugar ends. This is consistent with previous years. AO82611-7 appears to be adapted to areas with long, warm growing seasons.

ATX85404-8: This round, white clone is a Texas selection of an Aberdeen seedling. It is being considered for release by Texas. ATX85404-8 resulted from a cross of Gemchip and ND860-2. At Aberdeen, in 1996, it yielded more than Atlantic but less than Chipeta. It had a high percentage of its tubers in the 4-12 oz size range. It generally had better chip color than either Atlantic or Chipeta. In the past, ATX85404-8 has shown some ability to chip from cold storage. This past year it had 15%

hollow heart, a weakness that has shown up on the past.

COO83008-1: This long, russeted clone is an Oregon selection of a Colorado seedling. It resulted from a cross of Century Russet and WNC672-2 (A6334-20 x Lenape). Release is currently being pursued by Oregon. COO83008-1 had lower yield than Russet Burbank in two of three 1996 trials (Tables 6, 7, 8). It also had a very high percentage of U.S. NO. 1's and excellent internal quality. In 1996, a problem was noted with stem end discoloration in stored tubers from several trials. Some tendency for this problem had been seen in past years.

NDO1496-1: This round, white chipping clone is an Oregon selection of a North Dakota seedling. It is the result of a cross between ND292-1 and A77268-1 (Lemhi Russet x Norchip). Due to susceptibility to shatter bruise, Oregon researchers dropped NDO1496-1, and it is now being evaluated by the Idaho industry. In 1996, it was grown in a trial at Aberdeen where it had yields higher than Atlantic and similar to Chipeta and Gemchip (Table 3). It had specific gravity similar to Atlantic and chip color better than any of the standard varieties. NDO1496-1 has shown the ability to chip acceptably from cold storage and to recondition well.

IDAHO TABLE 1. Performance of advanced russet potato selections grown at Aberdeen, Idaho in 1996.

Clone	Total Yield	U.S. No. 1's		U.S. No. 2's		Specific Gravity	Hollow ¹ Heart	Blackspot ² Bruise	Fry Color ³		Merit ⁴ Score
		Yield	%	> 12 oz	6 to 12 oz				40°F	45°F	
	-----cwt/acre-----				%						
Russet Burbank	401	301	75	10	42	1.082	4	3.1	3.9	0.9	3.0
Ranger Russet	433	381	88	24	49	1.090	0	3.4	4.0	1.0	4.0
Lemhi Russet	446	379	85	23	46	1.087	5	4.3	3.0	0.6	3.3
A8894-8	575	489	85	40	37	1.089	0	3.7	4.0	1.0	4.0
A86102-6	540	486	90	30	48	1.083	0	1.7	4.0	1.8	4.5
A81473-2	535	503	94	59	29	1.084	8	3.5	3.8	1.4	3.3
A8838-1	473	426	90	40	42	1.089	13	2.5	3.6	0.8	3.5
A89512-3	466	396	85	22	46	1.086	3	2.1	4.0	0.6	3.0
A89149-7	446	370	83	30	43	1.089	0	2.6	3.2	1.7	3.5
A81386-1	432	393	91	25	54	1.080	0	3.7	1.8	0.3	3.8
A9057-7	415	340	82	29	40	1.085	8	3.6	4.0	1.6	3.3
A88236-6	413	368	89	40	37	1.081	0	2.8	3.2	0.9	3.3
A9014-2	411	374	91	44	38	1.085	13	3.0	2.3	0.8	3.8
A84118-3	401	337	84	8	49	1.092	0	3.3	3.7	0.9	3.0
A89384-10	396	333	84	29	45	1.088	18	2.3	4.0	1.5	3.8
A8495-1	388	322	83	18	43	1.091	3	3.6	3.2	0.8	3.5
A88236-4	373	317	85	24	49	1.082	0	3.7	3.8	1.3	2.8
A89321-6	356	274	77	17	46	1.089	6	3.6	2.9	1.2	3.5
A90234-7	333	280	84	18	48	1.093	5	2.7	2.8	0.4	2.8
A9082-2	330	264	80	21	43	1.088	0	3.6	3.5	0.4	3.0
Mean	434	373	86	30	43	1.086	4	3.0	3.4	1.0	3.5
LSD (.05)	47	59				0.004		0.4	0.5	0.4	0.8

¹ Hollow heart was measured by cutting tubers > 12 oz.² 1-5 scale with 1 = resistant, 5 = susceptible.³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 40° or 45°F until late February.⁴ Merit Score is similar to a breeder's preference rating and is based on overall appearance and size of field run potatoes, 1-5 scale with 5 = best.

IDAHO TABLE 2. Performance of advanced high dry matter potato selections grown at Aberdeen, Idaho in 1996.

Clone	Total Yield	U.S. No. 1's		Culls & U.S. No. 2's		Specific Gravity	Hollow ¹ Heart	Blackspot ²		Fry ³ Color	Dry Matter Yield
		Yield	%	> 12 oz	6 to 12 oz			< 4 oz	Malformed		
	-----cwt/acre-----				%		-----				lb/A
Russet Burbank	390	296	76	14	44	1.077	0	19	4	3.0	7,940
Ranger Russet	447	389	87	21	48	1.090	0	9	4	4.1	10,200
A82360-7	543	445	82	21	47	1.090	3	12	6	3.7	12,450
A8787-2	502	432	86	23	47	1.096	10	10	3	4.8	12,100
A8836-5	529	471	91	35	45	1.089	0	8	0	3.4	11,990
A88245-8	518	477	92	34	51	1.089	23	4	4	3.0	11,690
A84420-5	427	312	73	4	33	1.112	0	27	0	3.5	11,630
A88282-2	515	474	92	24	56	1.088	0	7	1	1.5	11,590
A88345-2	540	491	91	46	36	1.082	0	8	2	4.1	11,440
A8972-8	485	432	89	22	58	1.087	0	10	2	2.1	10,780
A89219-7	458	426	93	54	34	1.084	0	3	8	3.3	9,880
Mean	487	424	87	27	45	1.089	1	11	3	3.3	11,060
LSD (.05)	32	45				0.005				0.4	890

¹ Hollow heart was measured by cutting tubers > 12 oz.² 1-5 rating with 1 = resistant, 5 = susceptible.³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 3. Performance of advanced chipping potato selections grown at Aberdeen, Idaho in 1996.

Clone	Total Yield	U.S. No. 1's		Culls and U.S. No. 2's		Specific Gravity	Hollow ¹ Heart	Bruise	Blackspot ²	Chip Color ³		Merit ⁴ Score		
		Yield	%	>12 oz	4 to 12 oz					<4 oz	Malformed		Feb45°F	Feb40°F
-----cwt/acre----- % ----- -%--														
Atlantic	365	318	87	12	72	16	0	1.097	0	2.9	2.4	4.8	1.9	3.0
Chipeta	418	397	95	35	59	5	0	1.088	0	3.0	1.0	3.9	1.4	4.0
Gemchip	435	387	89	22	68	11	0	1.092	0	4.1	1.5	3.9	1.8	4.5
A90450-16	470	367	78	12	66	22	0	1.105	3	2.9	1.1	2.8	1.5	3.3
A87109-10	461	424	92	17	75	8	0	1.099	0	3.0	1.3	3.0	1.2	4.0
A8961-14	443	408	92	28	64	7	0	1.093	0	2.0	1.6	3.8	1.4	3.8
NDO1496-1	420	378	90	19	71	10	0	1.095	0	2.3	1.0	3.4	1.4	4.0
NDA2031-2	418	318	76	4	72	24	0	1.092	0	1.8	1.1	1.8	1.0	2.8
A90467-14	411	366	89	18	70	11	1	1.099	13	2.6	1.0	2.3	1.3	3.8
A88356-1	389	354	91	31	59	7	3	1.078	23	3.4	1.4	4.4	1.0	4.3
A80559-3	375	300	80	9	71	19	0	1.106	0	3.2	1.0	3.0	1.1	3.5
A89620-26	361	296	82	41	42	5	13	1.090	8	2.9	1.2	3.5	1.4	3.0
Mean	411	349	85	19	16	13	2	1.095	5	2.7	1.3	3.4	1.3	3.5
LSD (.05)	42	55						0.004		0.5	0.4	0.5	0.4	0.8

¹ Hollow heart was measured by cutting tubers > 12 oz.² 1-5 scale with 1 = resistant, 5 = susceptible.³ Chip color rated using the SFA color chart, 0-5 scale with 2 or less considered acceptable. Tubers stored at 40°F or 45°F. Tubers held at 40°F were also reconditioned for 3 weeks at 65°F.⁴ Merit score is similar to a breeders' preference rating and is based on appearance and size of field-run potatoes, 1-5 scale with 5 = best.

IDAHO TABLE 4. Performance of potato selections in the Idaho location of the Western Regional chipping trial grown at Aberdeen, Idaho in 1996.

Clone	Total Yield	Culls and						Specific Gravity	Hollow ¹ Heart	Blackspot ² Bruise	Shatter ² Bruise	Chip Color ³		
		U.S. No. 1's		U.S. No. 2's		40°F	50°F							
		Yield	%	<4 oz	Malformed									
-----cwt/acre-----														
-----cwt/acre-----														
Atlantic	410	338	82	13	51	16	1	1.095	10	1.9	2.8	4.3	2.0	1.6
Chipeta	519	364	70	39	27	4	26	1.087	0	2.0	3.3	4.0	1.9	3.0
A88431-1	521	410	79	13	48	17	5	1.103	0	1.9	3.2	3.6	1.4	2.0
A87109-10	509	455	89	16	61	8	2	1.098	0	2.2	2.4	4.3	1.5	1.8
A88356-1	504	407	81	21	51	8	12	1.102	13	3.0	3.3	4.6	3.2	1.7
ATX85404-8	460	378	82	17	47	14	4	1.088	15	2.5	2.6	3.4	1.5	2.6
CO87106-5	417	252	60	1	29	39	0	1.097	0	1.8	2.6	3.9	1.8	2.4
AC87313-3	407	328	81	9	45	18	2	1.092	0	2.9	3.8	3.5	1.5	1.4
BC0894-1	396	324	82	7	51	17	1	1.078	3	1.6	3.0	3.9	1.2	2.1
Mean	460	362	78	15	46	16	6	1.093	4	2.2	3.0	3.9	1.7	2.1
LSD (.05)	62	63						0.004		0.5	0.5	0.5	0.4	0.5

¹ Hollow heart was measured by cutting tubers > 12 oz.

² 1-5 scale with 1 = resistant, 5 = susceptible.

³ Chip color rated using the SFA chart on a 0-5 scale with 2 or less considered acceptable. Tubers were stored until early January at 40° or 50°F, and tubers stored at 40°F were reconditioned for 3 weeks at 60°F.

IDAHO TABLE 5. Performance of russet potato selections in the Idaho location of the Tri-state (Idaho, Oregon, Washington) potato variety trial grown at Aberdeen, Idaho in 1996.

Clone	Total Yield	U.S. No. 1's				Culls and U.S. No. 2's				Specific Gravity	Hollow ¹ Heart	Blackspot ²		Shatter ² Bruise	Fry Color ³		
		Yield		%		6 to 12 oz		Malformed				Bruise	Bruise		40°F	45°F	
		-----cwt/acre----- % -----															
Russet Burbank	415	322	78	14	39	18	4	1.085	3	4.1	2.8	4.0	1.4				
Ranger Russet	425	361	85	28	44	9	6	1.085	0	4.3	2.8	4.0	1.8				
A88345-2	552	498	90	46	36	7	3	1.081	0	3.4	3.0	4.0	2.2				
A8894-8	544	466	86	37	37	10	4	1.091	0	3.3	1.7	4.0	2.1				
AO87277-6	495	419	85	24	44	10	5	1.092	0	4.1	3.3	3.4	0.8				
AO89128-4	454	348	77	5	43	20	3	1.097	3	2.5	2.7	2.7	0.6				
A81480-6	436	397	91	41	42	4	5	1.086	35	3.3	2.8	2.9	2.2				
A8787-2	434	359	83	19	45	14	3	1.095	8	4.6	2.5	3.3	1.4				
A8836-5	429	340	79	26	36	15	5	1.082	0	2.8	2.3	4.0	1.9				
AO87119-3	410	321	78	13	40	16	6	1.074	0	3.6	2.7	4.0	2.2				
Mean	454	377	83	25	41	12	5	1.087	4	3.6	2.6	3.6	1.7				
LSD (.05)	61	57						0.004		0.6	0.7	0.4	0.3				

¹ Hollow heart was measured by cutting tubers > 12 oz.

² 1-5 scale with 1 = resistant, 5 = susceptible.

³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 40° or 45°F.

IDAHO TABLE 6. Performance of russet and processing potato selections grown at Parma, Idaho in 1996.

Clone	Total Yield	U.S. No. 1's		Culls & U.S. No. 2's		Specific Gravity	Hollow ¹ Heart	Fry ² Color	Sugar ³ Ends
		Yield	%	> 12 oz.	6 to 12 oz.				
	-----cwt/acre-----		-----	-----	----- % -----		-----	-----	-----
Russet Burbank	586	445	76	19	42	1.077	33	1.5	55
Ranger Russet	564	503	89	46	37	1.084	3	1.5	43
Shepody	617	570	92	70	19	1.075	0	1.8	49
A82360-7	765	656	86	28	48	1.088	0	1.2	20
A81473-2	677	634	94	73	18	1.084	3	1.8	24
AO82611-7	647	582	90	35	46	1.084	3	1.2	22
A89129-5	637	568	89	24	57	1.088	0	1.0	39
A8893-1	563	540	96	51	36	1.077	0	1.4	34
COO83008-1	546	482	88	59	26	1.082	0	1.2	42
A8905-3	507	426	84	35	41	1.085	5	1.7	44
A84118-3	503	434	86	21	51	1.093	0	1.3	49
A8495-1	485	436	90	40	37	1.085	0	1.1	34
Mean	591	523	88	42	38	1.083	3	1.4	38
LSD (.05)	114	109				0.005		0.2	12

¹ Hollow heart was measured by cutting tubers > 12 oz.² USDA fry grade score with lower score indicating lighter color; potatoes stored at 45°F.³ Percent of tubers producing fries with ends rated 3+ and at least 1 full point darker than the remainder of the fry.

IDAHO TABLE 7. Performance of russet potato selections grown at Rexburg, Idaho in 1996.

Clone	Total Yield	U.S. No. 1's		U.S. No. 2's		Specific Gravity	Hollow ¹ Heart	Blackspot ²		Shatter ² Bruise	Fry Color ³	
		Yield	%	>12 oz	6 to 12 oz			<4 oz	Malformed		40°F	45°F
	-----cwt/acre-----				%		-%-					
Russet Burbank	250	166	66	3	39	1.078	6	18	15	2.0	4.0	1.4
RB Newleaf	241	151	63	2	32	1.078	32	29	8	2.4	4.0	1.8
Frontier Russet	237	194	82	11	51	1.086	0	14	4	2.0	3.9	2.1
Ranger Russet	320	265	83	18	46	1.086	0	8	9	2.8	3.6	1.4
A82360-7	343	275	80	8	46	1.090	0	15	4	1.9	2.1	0.4
A8792-1	327	254	78	14	47	1.091	0	6	16	1.7	3.1	1.1
A86102-6	324	243	75	4	47	1.085	0	17	8	1.3	3.2	1.8
A81473-2	286	247	86	17	53	1.088	0	8	6	1.8	3.1	0.8
A8495-1	283	209	74	2	36	1.091	0	25	1	2.5	2.2	0.7
AC83064-6	246	206	84	13	51	1.081	0	10	6	2.7	2.8	0.7
A84118-3	225	158	70	2	32	1.091	4	27	3	1.4	2.5	0.7
COO83008-1	222	193	87	18	56	1.086	0	9	5	1.8	3.2	1.3
Mean	275	213	77	9	45	1.086	4	16	7	2.0	3.1	1.2
LSD (.05)	47	47				0.004				0.3	0.3	0.3

¹ Hollow heart was measured by cutting tubers > 12 oz.² 1-5 scale with 1 = resistant, 5 = susceptible.³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 40° or 45°F.

IDAHO TABLE 8. Performance of russet potato selections grown at Shelley, Idaho in 1996.

Clone	Total Yield	Culls and										Shatter ² Bruise	Fry Color ³	
		U.S. No. 1's		U.S. No. 2's				Specific Gravity	Hollow ¹ Heart	Blackspot ²			40°F	45°F
		Yield	%	>12 oz	6 to 12 oz	%	<4 oz			Malformed	Bruise			
								-----cwt/acre-----						

Russet Burbank	310	172	55	4	29	22	22	1.081	18	3.0	3.4	3.7	1.8	
Frontier Russet	323	247	76	14	44	17	7	1.080	8	2.8	2.6	3.8	2.5	
Goldrush	249	171	69	5	36	27	5	1.074	0	4.2	3.4	3.7	2.1	
Ranger Russet	459	364	79	25	41	9	11	1.088	4	4.1	3.2	3.2	1.8	
Russet Norkotah	159	82	52	1	19	47	1	1.070	2	3.1	3.1	3.9	2.2	
A8792-1	502	431	86	30	43	6	8	1.089	24	2.3	3.1	3.6	2.0	
A82360-7	473	372	79	10	44	21	5	1.092	6	2.5	2.6	2.8	1.6	
COO83008-1	377	325	86	28	45	7	6	1.083	2	2.7	3.4	3.0	2.1	
A8495-1	367	270	74	6	43	23	3	1.089	2	3.2	3.1	2.5	1.2	
A84118-3	290	203	70	8	37	25	5	1.091	12	1.6	2.7	3.1	1.9	
Mean	351	264	73	13	38	20	7	1.084	7	3.0	3.1	3.3	1.9	
LSD (.05)	48	41						0.003		0.4	0.3	0.3	0.2	

¹ Hollow heart was measured by cutting tubers > 12 oz.² 1-5 scale with 1 = resistant, 5 = susceptible.³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 40° or 45°F.

IDAHO TABLE 9. Sensory evaluations of baked potatoes from breeding selections grown at Aberdeen, Idaho in 1996.¹

Clone	At harvest			After 5 Months Storage (40°F)				
	Color	Texture	Flavor	Overall	Color	Texture	Flavor	Overall
Russet Burbank	6.8 a	6.4 a	6.3 ab	6.3 a	6.5 b	6.1 b	5.9 b	6.1 b
A8495-1	6.8 a	6.0 b	6.4 a	6.4 a	6.7 b	6.4 a	6.4 a	6.5 a
A84118-3	7.0 a	6.1 b	6.1 b	6.2 a	6.7 b	5.7 d	5.6 c	5.7 d
A82360-7	6.8 a	6.0 b	6.1 ab	6.1 a	6.8 ab	6.0 bc	6.1 b	6.1 b
A8792-1	6.7 a	6.0 bc	6.1 b	6.1 a	6.8 ab	6.1 b	6.2 ab	6.3 ab
A8894-8	6.4 b	5.7 c	5.7 c	5.8 b	6.2 c	5.7 cd	5.5 c	5.6 d

¹ Evaluations were made by trained panelists using double blind procedures. Approximately 100 tests were done on each clone. Each baked potato was rated for color, texture, flavor, and overall appeal. Ratings were made using a 1-9 scale with 9 = best. Means were separated using Duncan's Multiple Range Test, and means followed by the same letter are not significantly different.

IDAHO TABLE 10. Reaction of potato clones to the herbicide metribuzin (Sencor/Lexone).¹

Clone	Plant Injury ² 21 Days Following Application	Predicted ³ Yield Reduction Due to Injury ²	Relative ⁴ Susceptibility to Injury
----- % -----			
<u>Russet and Long Whites</u>			
Calwhite	68	44	S
Nooksack	23	4	R
Russet Burbank	13	0	VR
Russet Norkotah	3	0	VR
Shepody	99	100	VS
A81473-2	30	9	MR
A81480-6	20	0	VR
A82360-7	15	1	R
A84118-3	8	0	VR
A8495-1	10	0	VR
A86102-6	5	0	VR
A8787-2	13	0	VR
A8792-1	5	0	VR
A88345-2	5	0	VR
A8836-5	0	0	VR
A8894-8	40	20	MS
AO85165-1	0	0	VR
AO87119-3	0	0	VR
AO87277-6	28	10	MR
AO89128-4	13	0	VR
ATX84706-2Ru	0	0	VR
CO85026-4	8	0	VR
COO83008-1	5	0	VR
TX1229-2Ru	13	0	VR
TX1385-12Ru	13	0	VR
TXAV657-27Ru	0	0	VR
<u>Chipping Selections</u>			
Atlantic	60	36	S
A87109-10	23	6	MR
A88356-1	43	20	MS
A88431-1	40	16	MS
AC87313-3	5	0	VR
ATX85404-8	85	66	VS
BC0894-2	35	15	MS
CO87106-5	20	2	R
NDA2031-2	45	23	MS
NDO1496-1	18	1	R
<u>Reds</u>			
AD82706-2R	28	12	MS
CO86142-3	50	24	MS
CO86218-2	15	0	VR
Dt6063-1R	15	0	VR

¹ Metribuzin applied postemergence (8-12 inch plants) at a rate of 1.0 lb a.i./A (17.5 gpa, 30 psi).² Plant injury was recorded as the percentage of foliage from an average plant in each plot that showed typical metribuzin symptoms (chlorosis, necrosis, vein clearing, etc.)³ Predicted yield reduction is expressed as percent loss compared to untreated plots and was calculated using the following equation: Yield reduction = $[1 - (1.142 + 0.176 (\log (\text{plant height treated} / \text{plant height untreated})) - 0.00796 (\text{plant injury}))] \times 100$.⁴ VR = very resistant, R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible.

IDAHO TABLE 11. Evaluation of potato breeding selections and cultivars for resistance to field diseases and soft rot, 1996.

	Cultivar or Selection	Verticillium Wilt ¹	Early Blight ²	Common Scab ³	Erwinia Soft Rot ⁴
WESTERN REGIONAL TRIAL	A82360-7	2.7	4.0	<0.1	2.4
	A84118-3	4.0	4.0	<0.1	3.0
	A86102-6	4.3	5.7	<0.1	2.4
	A8792-1.....	3.7	4.3	0.6	2.1
	AO85165-1	4.0	5.3	0.0	2.7
	CO85026-4	2.3	4.3	0.0	3.0
	TX1229-2Ru	6.7	5.7	<0.1	4.8
	TX1385-12Ru.....	4.3	6.3	0.5	4.1
	TXAV657-27Ru	4.3	5.3	0.4	3.0
	ATX84706-2Ru.....	7.0	5.7	1.2	3.8
	TXNS112.....	6.7	5.3	<0.1	2.5
	TXNS278.....	6.3	5.7	<0.1	3.5
TRI STATE TRIAL	A81480-6	2.7	3.7	<0.1	2.7
	A8787-2.....	3.0	3.7	<0.1	2.8
	A8836-5.....	3.0	5.0	<0.1	2.2
	A8894-8.....	4.7	4.7	0.0	1.3
	A88345-2	1.7	4.0	<0.1	2.8
	AO87119-3	5.7	5.3	<0.1	2.3
	AO90128-4	3.7	4.0	0.6	2.2
	RR622(95).....	3.7	5.0	0.8	2.0
CHIP TRIAL	A87109-10.....	3.0	4.3	0.3	2.3
	A88356-1	2.3	5.0	0.5	4.6
	A88431-1	3.3	5.0	1.3	3.7
	AC87313-3	3.7	5.3	0.6	4.5
	ATX85404-8	4.7	5.0	1.2	3.6
	BC0894-2.....	7.0	6.7	<0.1	3.3
	CO87106-5	4.7	5.0	0.3	3.3
NAMED VARIETIES	Atlantic.....	4.7	6.0	<0.1	3.4
	Chipeta	3.3	5.0	<0.1	3.0
	Ranger Russet.....	2.7	5.3	0.0	2.9
	Red LaSoda.....	4.7	6.0	0.6	3.8
	Russet Burbank	6.7	5.0	<0.1	3.1
	Russet Norkotah	7.0	6.0	0.7	2.1
	Shepody.....	5.7	6.0	<0.1	4.1
	LSD (p=0.05)	1.7	1.7	0.9	1.5

¹ Verticillium wilt 0 to 9 scale: 0 = none; 9 = >90% stems dead or dying with typical Verticillium wilt symptoms.

² Early blight 0 to 9 scale: 0 = none; 9 = >90% leaflets with severe blight lesions or necrosis due to early blight.

³ Common scab 0 to 5 scale; 0 = none; TR = Trace; 5 = all tubers unmarketable due to scab.

⁴ Erwinia soft rot 0 to 5 scale; 0 = no rot; 5 = all tubers >50% decayed.

IDAHO TABLE 12. Evaluation of varieties, advanced breeding selections, and resistant germplasm for late blight resistance (US11 A1 strain) at Mt. Vernon, WA, 1996.

	Clone	AUDPC ¹	% Tuber Blight ²
VARIETIES	Russet Norkotah	2479 a	15.3 bc
	Atlantic	2021 c-f	1.9 fgh
	Shepody	1868 e-l	21.2 b
	Russet Burbank	1776 f-k	0.15 h
	Katahdin	1742 g-l	6.5 d-h
	Ranger Russet	1741 g-l	2.4 e-h
	Kennebec	1674 h-m	7.3 d-h
	Chipeta	1529 k-o	9.5 cde
	Elba	1498 l-o	2.6 e-h
	White Rose	1419 m-p	36.4 a
	Brodict	606 uv	2.1 e-h
	Brador	465 vwx	1.7 fgh
	Bzura	225 x	5.0 d-h
WESTERN REGIONAL TRIAL	ATX84706-2RU	2356 ab	8.4 c-f
	TX1229-2RU	2160 bc	6.6 d-h
	TXAV657-27RU	2147 bcd	7.4 d-h
	TX1385-12RU	2040 cde	6.7 d-h
	A86102-6	1745 g-l	8.1 c-g
	AO85165-1	1622 i-n	11.1 cd
	CO85026-4	1562 k-o	3.7 d-h
	A8792-1	1383 n-q	4.8 d-h
	A84118-3	1130 qrs	.05 h
	A82360-7	941 st	1.5 fgh
TRI-STATE TRIAL	AO89128-4	1978 c-g	4.3 d-h
	AO87119-3	1854 e-j	.45 h
	A8894-8	1702 h-l	6.2 d-h
	A8787-2	1622 i-n	5.4 d-h
	A8836-5	1500 l-o	3.0 e-h
	A88345-2	1339 o-r	10.8 cd
ADVANCED SELECTIONS AND RESISTANT GERMPLASM	AO82611-7	2064 cde	1.8 fgh
	A82705-1R	1872 e-i	1.3 fgh
	A81473-2	1713 h-l	2.4 e-h
	COO83008-1	1503 l-o	1.3 fgh
	A90587-5	1120 rs	.31 h
	AWN85510-2	1110 rs	.15 h
	AWN85542-2	780 tu	3.0 e-h
	A90586-11	614 uv	2.6 e-h
	AWN86514-2	572 uvw	.59 gh
	AWN86524-5	497 vw	1.7 fgh
	G6582-3	461 vwx	8.1 c-g
	AWN85540-1	343 wx	8.6 c-f
	LSD (p=.05) ³	260.5	7.51

¹ AUDPC = area under the disease progress curve; foliage was rated weekly 1 July through 11 Sept.

² Percent tuber blight by weight at harvest.

³ Values in the same column followed by the same letter are not significantly different (P=0.05).

IDAHO TABLE 13. Evaluation of varieties, breeding selections, and resistant germplasm for late blight resistance (US8 A2 strain) at Corvallis, OR, 1996.

	Clone	AUDPC ¹
1.	BO767-2	182 a ²
2.	BO692-4	210 a
3.	J101-K6-A22	261 a
4.	BO718-3	291 a
5.	G6582-3	317 a
6.	J101-K9	378 a
7.	A90586-11	485 ab
8.	AWN86514-2	516 ab
9.	AWN86524-5	524 ab
10.	J101-K6	541 abc
11.	Greta	822 bcd
12.	J101-K7	904 cde
13.	Libertas	1073 def
14.	Bzura	1168 defg
15.	Pimpernel	1200 efg
16.	J138-A4	1365 fgh
17.	A90587-5	1402 fgh
18.	Bentita	1441 ghi
19.	Brador	1574 hij
20.	AWN85542-1	1716 hij
21.	Ozette	1722 hij
22.	BO749-2F	1724 hij
23.	AWN85540-1	1798 ij
24.	AWN85510-2	1821 jk
25.	Brodict	1936 jkl
26.	A82360-7	2173 klm
27.	COO83008-1	2266 lmn
28.	A84118-3	2321 mno
29.	Ranger Russet	2622 nop
30.	Russet Burbank	2635 op
31.	Shepody	2724 p
32.	Russet Norkotah	2901 p

¹ Area under the disease progress curve.

² Means followed by the same number are not significantly different according to Fisher's Protected LSD (P = 0.05).

IDAHO TABLE 14. The leafroll net necrosis reaction of important pacific northwest potato cultivars and advanced breeding selections.

Cultivars and Breeding Selections	% Total Defect ¹	% Serious Defect	Average Maximum Severity Rating ²	Average Overall Severity Rating	Years Tested
AO82611-7	0	0	1.6	1.1	3
A82360-7	1.4	0	1.8	1.3	2
A81473-2	1.9	0.3	1.6	1.2	7
Atlantic	4.2	2.0	1.8	1.2	6
Ranger Russet	7.6	0.3	2.4	1.5	9
A8495-1	8.8	0.4	2.6	1.6	6
Russet Norkotah	11.2	1.1	2.9	1.7	7
A84118-3	15.2	4.3	3.0	1.8	6
Shepody	16.6	10.9	2.9	1.9	7
Russet Burbank	17.5	2.6	3.0	1.9	9
CalWhite	29.3	13.4	4.1	2.2	3
Frontier Russet	30.8	10.7	3.6	2.1	6
COO83008-1	36.3	9.4	3.8	2.3	4
LSD (p=0.05)	14.9	8.9	0.9	0.5	

¹ % total defect = % moderate plus serious internal discoloration that appeared to be leafroll net necrosis.

Moderate internal defect when removal causes a loss of more than 5% of the total weight of the tuber; a serious defect when removal causes a loss of more than 10%.

² Severity rating on a 0 to 5 scale with 0 = no symptoms and 5 = all tubers showing serious internal discoloration penetrating more than 50% of the tuber.

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Introduction: Forty-four potato varieties and clones were tested at Aroostook Farm, Presque Isle, Maine, as part of the NE107 Regional Project (Breeding and Evaluation of Potato Clones for the Northeast). The primary objective of this trial is to determine performance, quality, and storage characteristics of promising potato clones and new varieties in Maine. Eight additional lines from outside the NE107 project were included in the 1996 trials. These non-NE107 lines were Draga, Latona, Lili, Matilda, Morene, Morning Gold, Russet Norkotah, and Shepody. The majority of non-NE107 lines were entered into the trials by private companies. Seed of the NE107 varieties and lines was produced by the Maine Seed Potato Board under uniform growing conditions. All NE107 lines were also stored and handled uniformly. Seed of the non-NE107 lines came from a number of different seed farms and was thus exposed to a range of growing, storage, and handling conditions.

Methods: Single-row plots, 25 feet long, were hand planted on May 16, 1996, using a randomized complete block design and four replications. The seedpiece spacing used for each line is listed in subsequent tables. Plots were located on a site mapped as having the Caribou loam soil that is typical of the area. Soil nutrient levels were medium-high to high and the soil pH ranged from 5.3 to 5.8 for the five individual maturity class trials. The previous crop for the site was spring barley for all tests except the early and medium tablestock trials, which were preceded by peas. The entire site received a broadcast application of 200 lbs/A muriate of potash (0-0-60) prior to spring tillage. All varieties were fertilized with 1000 lbs/A of 14-14-14, banded at planting, and all received an additional 40 lbs/A of nitrogen, sidedressed on June 20. Linuron (1.0 lbs ai/A) was applied on June 6 for weed control. Rimsulfuron (0.0156 lbs ai/A) and X-77 (0.25% v/v) were applied to the early trial on July 1 to provide additional grass and broadleaved weed control. Cultural practices were similar to those used on commercial farms in the area and varieties were grouped so that separate tests could be vinekilled and harvested based on maturity classification. Specific gravity was determined at harvest using the weight-in-air/weight-in-water method. Hollow heart ratings indicate the number of hollow tubers observed per 40 large tubers examined. Chip color evaluations were conducted from December 4-6, 1996, following storage at 50°F. Chips were fried at 350°F for three minutes and evaluated using an Agtron M35, calibrated with the black "0" disk = 0 and the white "90" disk = 90. Chips were crushed and reported values are means from four replicates per variety. Each sample was read three times with thorough mixing between readings.

Results:

General Growth and Plant Stands. All varieties produced greater than 90% stands in these studies, except for Yukon Gold (86%) and AF1426-1 (83%). The weather was cool and moist during June and July; however, August was warm and relatively dry. Most lines emerged quite quickly; however, AF1426-1 was relatively slow emerging. Snowden, AF1426-1, and NY87 were less vigorous than the other lines during June. Visual ratings indicated that Atlantic, Chieftain, Dark Red Norland, Draga, Kennebec, Latona, Lili, Morene, Morning Gold, Niska, Quaggy Joe, Shepody, Superior, AF1331-2, AF1424-7, AF1455-9, AF1475-16, AF1480-5, AF1565-12, B0564-8, B9922-11, ND2471-8, and W1099Rus emerged and developed rapidly. Moderate chlorosis, apparently from the linuron application, was noted on June 25 on Matilda, Shepody, Snowden, AF1565-12, ND2471-8, and W1099Rus. Snowden and W1099Rus foliage color was dark green by July 17; however, Matilda, Niska, Russet Norkotah, Shepody, St. Johns, AF1426-1, AF1433-4, AF1455-9, AF1481-4, AF1565-12, and ND2471-8 were unusually light green at that date. The early varieties received a postemergence application of rimsulfuron for weed control and, as a result, all of these lines displayed some foliar chlorosis on July 17, more than two weeks after treatment. The foliar symptoms were minor for Superior, Monona, AF1424-6, and AF1424-7; however, slight to moderate chlorosis was observed for AF1331-2 and moderate chlorosis was observed on AF1565-12.

Rainfall for May, June, July, and August totaled 3.99, 3.66, 5.12, and 2.56 inches, respectively. This gives a June 1 through August 31 total of 11.34 inches compared to the 30-year average of 11.3 inches. Plant growth was generally very vigorous due to the high early-season rainfall and yields were quite high for most lines. With the exception of AF1424-7 and Dark Red Norland, all lines produced moderately large to large plants with good ground cover. Plants of Century Russet, Latona, Lili, Matilda, Morene, and Morning Gold were exceptionally large and vigorous. Early dying was the only foliar disease observed and severity ratings were taken on August 19. Symptoms were rated moderately severe for Russet Norkotah and AF1481-4.

Early Maturity Trial. Superior and AF1331-2 were high yielding lines in the early maturity test (Maine Table 1). Total yields of AF1424-7 and AF1565-12 were statistically equal to the high yielding lines, while those of Monona and AF1424-6 were significantly lower. Marketable yields of all lines were statistically equal due to the high incidence of external tuber defects observed in all

lines except Monona (Maine Table 2). Hollow heart was detected in AF1424-6; however, incidence was relatively low even in this line. All lines except AF1424-7 and AF1565-12 sized well for table use. Monona and AF1565-12 were the most uniform in appearance and tubers of both were bright and attractive. Superior had unusually poor tuber shape and appearance in this trial. Normally, it produces attractive tubers with relatively few external defects. Common scab was present on AF1424-6 tubers. Chip colors from December storage were quite good for AF1424-6 and AF1424-7. Specific gravities of AF1424-6 and AF1424-7 were equal to Superior. Monona, AF1331-2, and AF1565-12 had very low specific gravities. AF1331-2 and AF1424-6 were mid-season in vine maturity, rather than early maturing.

Medium Maturity Chipping Trial. Atlantic, Kennebec, B0564-9, ND2417-6, and NY87 produced total yields exceeding 400 cwt/A in this trial (Maine Table 3). Yields of B0564-8, B0585-5, ND2471-8, NY102, NY103, and W870 were statistically equal to this high yielding group. Only MaineChip, Snowden, and AF1433-4 produced significantly lower total yields. Atlantic produced the highest U.S.#1 yields; however, U.S.#1 yields of most other lines were statistically equal to Atlantic. Only, Kennebec, B0585-5, and ND2471-8 produced U.S.#1 yields that were significantly lower than Atlantic. All three of these lines had very high incidence of external tuber defects (Maine Table 4). Kennebec had many growth cracked tubers, while sunburning was prevalent in B0585-5 and ND2471-8. Sunburned tubers were common in many varieties in this test, partly because wet weather reduced the effectiveness of our hilling program. Hollow heart was detected to varying degrees in Atlantic, MaineChip, Snowden, B0564-9, B0585-5, and ND2471-8. Kennebec, Atlantic, Snowden, B0564-9, B0585-5, NY87, NY102, and NY103 sized well for table use. MaineChip, B0585-5, NY87, and NY103 were given very good tuber appearance ratings. All four had nicely-shaped, bright tubers. AF1433-4, ND2417-8, and ND2471-8 also produced tubers with smooth, bright skins. Tubers of Snowden and W870 were rated relatively unattractive. Russet scab was prevalent on NY102 tubers. W870 produced many pear-shaped tubers. All of the test lines were similar to Atlantic and earlier than Kennebec in vine maturity.

Considering agron scores and visual ratings, the best chips were produced by MaineChip. Kennebec, Atlantic, B0564-9, ND2471-8 produced chips that were significantly darker than Snowden. Specific gravities of all lines except for AF1433-4 were greater than 1.085. Specific gravities of Atlantic, MaineChip, Snowden, and W870 were exceptionally high. Based on yields, chip color, internal quality, tuber appearance, and specific gravity, the best chipping prospects in this test were B0564-8, ND2417-6, NY87, NY102, and NY103.

Medium Maturity Tablestock Trial. Total yields of Kennebec, Atlantic, Chieftain, Draga, and Quaggy Joe exceeded 400 cwt/A in this test (Maine Table 5). Kennebec produced the highest total yields, while yield of Quaggy Joe was statistically equal to that of Kennebec. Cherry Red, Red Ruby, AF1425-1, AF1475-16, and ND1871-3R were relatively low yielding lines. Chieftain and Quaggy Joe produced the highest U.S.#1 yields. U.S.#1 yields of Atlantic, Dark Red Norland, and Draga were also relatively high. Kennebec, Atlantic, Cherry Red, Draga, Quaggy Joe, AF1425-1, and AF1475-16 had more than 10% external defects (Maine Table 6). Growth-cracked tubers were a severe problem for Kennebec. Kennebec and the other lines with >10% defects also had a high incidence of sunburned tubers. Kennebec, Chieftain, and AF1475-16 produced the largest tubers in this test. Hollow heart was detected only in Kennebec, Atlantic, and Cherry Red. Tuber appearance ratings were very good for Cherry Red, Chieftain, Ruby Red, and AF1425-1. Many tubers of AF1475-16 were pear shaped. Chieftain and Dark Red Norland tubers were an undesirable pale red color, while the other reds had a nice, deep red color. Kennebec and ND1871-3R were medium-late in vine maturity, while the remaining lines were medium maturing or earlier. Tubers of ND1871-3R adhered to the tops. None of the lines produced light-colored chips from December storage. Specific gravities were moderate for the test lines, but very high for Atlantic.

Late Maturity Trial. Latona produced the highest total yields in this experiment (Maine Table 5). Total and U.S.#1 yields of Latona, Lili, and Morning Gold were significantly higher than Katahdin, while Matilda and Niska were significantly lower yielding. Tubers of Latona and Lili were relatively small, while those of Matilda were very small. Incidence of external defects was not severe in this test (Maine Table 6). Only Katahdin and Niska exceeded 7% external defects. Hollow heart was detected in Morning Gold, AF1455-9, and AF1480-5. None of these late-maturing lines produced acceptable chip colors from December storage. Specific gravities of Morene, Morning Gold, and Yukon Gold were significantly higher than Katahdin. St. Johns and AF1455-9 had lower specific gravity than Katahdin. Tuber appearance ratings for Katahdin, Morning Gold, St. Johns, Yukon Gold, AF1455-9, and AF1480-5 were better than average. Yukon Gold and AF1480-5 tubers had a pink splash of color at the eyes. Latona and Matilda produced many pear-shaped tubers and were very late in vine maturity. Tubers of Morene skinned excessively at harvest and also adhered to the potato vines.

Russet-Processing Trial. Only Century Russet and Shepody produced significantly higher total yields than Russet Burbank; however, total yields of all other lines were statistically equal to those of Russet Burbank (Maine Table 1). U.S.#1 yields of Century Russet, Krantz, and B0493-8 were significantly higher than Russet Burbank. Century Russet, Shepody, AF1426-1, B0493-8, and B9922-11

produced significantly higher total yields than the low yielding standard, Russet Norkotah. Century Russet, Krantz, Shepody, B0493-8, B9922-11, and W1099Rus produced significantly higher U.S.#1 yields than Russet Norkotah. Century Russet had the highest marketable yields in this test. AF1481-4 and W1099Rus sized poorly. Russet Burbank and Century Russet tubers were the most elongated in shape (Maine Table 2). Tubers of AF1426-1 and Krantz were only slightly elongated and, in fact, many were round. Incidence of external defects was quite high for Russet Burbank, Shepody, AF1426-1, AF1481-4, and B0493-8. Many tubers of AF1481-4 were pear-shaped. Hollow heart was detected in Russet Burbank, AF1481-4, B9922-11, and W1099Rus. Tubers of Shepody and AF1426-1 were white-skinned, while all other lines were russeted. Russet Burbank and Krantz displayed relatively light russetting. Russetting of Russet Burbank was nonuniform. Tubers of B9922-11 were rated particularly attractive. Century Russet, Krantz, and B0493-8 also received good tuber appearance ratings. Century Russet was very late maturing, while the remaining test lines were earlier maturing than Russet Burbank.

Russet Norkotah and B0493-8 had specific gravities below 1.080. Specific gravity of B9922-11 was significantly higher than Russet Burbank. Fry colors from December storage were particularly good for Krantz, Shepody, AF1426-1, B9922-11, and W1099Rus. Century Russet and B0493-8 had very poor fry colors. Century Russet was the outstanding line for yields during 1996. It had good tuber size and attractive tubers, but it does not process well into french fries and vine maturity is extremely late. B9922-11 was another solid performer during 1996. Yields, tuber size, specific gravity, fry color, and tuber appearance were very good, although some hollow heart was detected.

Storage Evaluations. French fry color and texture of 10 lines were evaluated under simulated processing conditions (Maine Table 7). Only Century Russet produced french fries that were equal to Russet Burbank in quality. Limited data on storage and processing characteristics were collected from 53 varieties and clones during the 1995-96 storage season (Maine Table 8). Chip colors from 50°F storage in February were acceptable for many lines with anticipated chipping potential. Lines with outstanding chip color from 50°F February storage were: Monona, AF1424-6, AF1424-7, and AF1438-4 (early test); Atlantic, MaineChip, AF1426-1, B0564-9, B0585-5, ND2417-6, and NY87 (medium trial); Chipeta and AF1455-9 (late trial). MaineChip, AF1424-6, AF1424-7, AF1452-28, B0564-8, B0564-9, B0585-5, ND2417-6, ND2471-8, NY87, and W870 also produced very good chips directly from 45°F storage. Only AF1424-6 and AF1452-28 produced acceptable chips directly out of 38°F storage; however, most of the chipping lines reconditioned well from 38°F storage.

After-cooking darkening scores are presented in Maine Table 8. Atlantic, Cherry Red, Morene, Snowden, AF1425-1, AF1475-16, AF1455-9, B9922-11, ND2417-6, ND2471-8, and W870 received poor color scores. Sloughing was observed in Atlantic, MaineChip, Morene, AF1565-12, and ND2471-8. Washed appearance ratings were particularly outstanding for Chipeta, Kennebec, Russet Norkotah, Superior, AF1452-28, and B9922-11. The following lines had very high levels of silver scurf on their tubers: Cherry Red, Katahdin, Kennebec, Krantz, MaineChip, Mainstay, Monona, Morene, Quaggy Joe, Red Ruby, St. Johns, Shepody, Superior, AF875-15, AF1331-2, AF1379-3, AF1424-7, AF1426-1, AF1438-5, AF1455-9, AF1470-18, AF1565-12, ND2471-8, and W1099Rus. Black scurf incidence was high on tubers of Atlantic, Dark Red Norland, Goldrush, Katahdin, Mainstay, Russet Norkotah, St. Johns, AF1331-2, AF1433-4, AF1470-18, B0257-12, B0493-8, B0585-5, and NY87. Russet scab was a serious skin defect for B0257-12 and B0564-9, while common scab was noted as a surface defect for AF1433-4, AF1470-18, and B0564-9. Black dot was prevalent on the skin of Monona and AF1438-4.

Tuber dormancy was exceptionally short and early sprout growth was rapid for Goldrush, Krantz, Mainstay, AF1433-4, AF1455-9, AF1481-4, AF1565-12, B0493-8, B9922-11, ND2417-6, W1099Rus. Kennebec, Russet Burbank, and AF1426-1 required more than 170 days to reach the one-half-inch sprout stage. Selections with very low weight loss (3.0% or less) from 38°F storage were Cherry Red, Chieftain, Katahdin, Monona, Russet Burbank, Shepody, AF1425-1, AF1438-4, AF1438-6, B0257-12, B0493-8, and B9922-11. Selections with very low weight loss (12% or less) from 50°F storage were Kennebec, Russet Burbank, and AF1426-1. Dark Red Norland, Krantz, MaineChip, Mainstay, St. Johns, AF875-15, AF1424-7, AF1438-5, AF1455-9, AF1470-18, AF1481-4, AF1565-12, B0257-12, B0493-8, B0564-8, and W1099Rus had relatively high weight loss at 50°F.

Overall Summary. Selections that performed particularly well in the 1996 Aroostook Farm NE107 trials were AF1424-7 (early maturing, chipping line); Draga and Quaggy Joe (mid-season, tablestock round-whites); ND2417-6 and B0564-8 (mid-season chipstock lines); NY87, NY102, NY103 (mid-season chipstock and table lines); Morning Gold (late-season, tablestock round-white); Century Russet (very late maturing, table russet); and B9922-11 (late maturing, dual-purpose, russet).

Maine Table 1. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for six early-maturing and ten russeted/processing varieties grown at Presque Isle, Maine - 1996.

Variety	Total Yield cwt/A	US#1 Yield (cwt/A) >1 7/8" % of std.	%	Stand (spacing) ²	50% Emerg. Date	Size Distribution by Class ³ (%)											Spec. Grav.
						1	2	3	4	5	6	1 7/8	2 1/4	2 1/2			
Early Test- 96 days																	
Superior (std)	391	270	100	230	100(10)	6-8	3	15	28	39	13	1	96	81	53	1.082	
Monona	296	263	97	231	100(10)	6-12	4	12	21	54	9	1	95	83	63	1.069	
AF1331-2	390	280	104	247	95(10)	6-10	4	11	21	46	17	0	95	83	62	1.067	
AF1424-6	248	203	75	185	96(10)	6-15	2	9	14	55	17	3	95	86	72	1.082	
AF1424-7	335	262	97	203	97(10)	6-12	6	22	33	37	3	0	94	73	40	1.081	
AF1565-12	341	235	87	180	100(10)	6-9	7	23	32	36	2	0	93	70	38	1.069	
W. Duncan LSD	64	ns		ns									ns	7	14	0.004	
Russet/Processing Test - 120 days																	
R. Burbank (std)	383	329	100	296	100(16)	6-10	10	29	29	20	11		58	60	31	1.085	
Century Russet	506	492	150	439	100(16)	6-10	11	30	34	18	7		64	59	25	1.084	
Krantz	417	398	121	343	98(12)	6-9	14	36	28	13	10		64	50	22	1.082	
R. Norkotah	306	287	87	225	99(14)	6-12	22	34	22	11	10		56	44	22	1.073	
Shepody	475	378	115	339	100(10)	6-12	11	29	25	16	19		54	60	35	1.083	
AF1426-1	394	264	80	254	83(14)	6-17	4	14	22	21	38		36	81	59	1.081	
AF1481-4	370	302	92	254	94(16)	6-10	16	45	31	8	1		76	39	8	1.087	
B0493-8	455	405	123	378	97(16)	6-11	7	21	25	18	26		46	69	45	1.072	
B9922-11	424	392	119	352	99(16)	6-11	10	37	26	13	14		63	53	27	1.090	
W1099Rus	381	369	112	301	100(16)	6-8	19	46	22	12	2		68	35	13	1.085	
W. Duncan LSD	85	65		71										11	12	0.005	

¹U.S.#1 yield of early varieties = yield 1⁷/₈ to 4" excluding external defects. U.S.#1 yield of russet/proc. varieties = yield > 4 oz. excluding external defects.

²Inches between seedpieces noted within parentheses.

³Size classes for early varieties: 1=1¹/₂ to 1⁷/₈"; 2=1⁷/₈ to 2¹/₄"; 3=2¹/₄ to 2¹/₂"; 4=2¹/₂ to 3¹/₄"; 5=3¹/₄ to 4"; 6=over 4". Size classes for russeted/processing varieties: 1= <4 oz; 2=4 to 8 oz.; 3=8 to 12 oz.; 4=12 to 16 oz.; 5= >16 oz.

Table 2. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip colors for six early-maturing and ten russeted/processing varieties grown at Presque Isle, Maine - 1996.

Variety	Plant Data ¹		Tuber Data ¹		Appear- ance	Tuber Defects (%)				Hollow	
	Size	Vine	Matur.	Skin		Sun-	Mis-	Growth	Heart	Chip	
	7-17	8-19	at	Tex-		Total burn	shapen	cracks	Rot	Rating ²	Color ³
8-19 Vinekill ture											
<u>Early Test- 96 days</u>											
Superior (std)	8	4	4.0	6	3	29.8	3.6	3.4	22.4	0.5	46dr
Monona	4	5	5.0	8	6	6.7	5.6	0.1	0.6	0.4	53dr
AF1331-2	7	5	5.5	7	3	24.2	8.3	2.4	12.9	0.6	27bl,dr
AF1424-6	6	6	6.3	8	4	14.3	3.6	1.3	9.4	0.0	64bl
AF1424-7	5	4	4.5	7	5	17.2	3.4	0.3	13.4	0.1	64bl
AF1565-12	6	3	3.5	8	7	26.2	6.9	0.9	17.9	0.4	38dr
<u>Russet/Processing Test - 120 days</u>											
8-19 8-19											
R. Burbank (std)	8	8	6.5	4	4	13.8	2.4	10.6	0.9	0.0	35bl,dr
Century Russet	9	9	7.3	3	6	3.0	1.4	0.4	1.2	0.0	22bl,dr
Krantz	8	7	5.0	wh.4	6	4.6	0.7	0.5	3.4	0.0	45dr
R. Norkotah	6	5	4.3	3	5	6.3	2.9	2.6	0.8	0.0	32bl,dr
Shepody	8	5	5.0	wh.7	4	20.1	9.2	10.6	0.0	0.1	40dr
AF1426-1	7	7	5.3	wh.7	2	32.3	13.0	3.6	14.3	1.4	49dr
AF1481-4	7	6	6.3	2	3	17.7	0.5	0.5	16.7	0.1	36dr
B0493-8	8	7	5.5	2	6	10.9	2.7	3.4	2.1	2.7	28bl,dr
B9922-11	8	7	5.8	2	8	7.6	0.5	1.2	5.9	0.0	43bl,dr
W1099Rus	8	7	4.0	2	4	3.0	0.1	0.9	1.7	0.2	44dr

¹See standard NE107 rating system for key to codes.

²Hollow heart rating equals the number of hollow tubers found per 40 large tubers cut and examined.

³Chip color -- Agron M35 (higher values indicate lighter color): >60 acceptable; dr = dark vascular ring; bl = mod. to severe blistering. Waller Duncan LSD (K=100) for chip color = 4 (early test) and 4 (russet/processing test).

Maine Table 3. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for 14 medium-maturing, chipping varieties grown at Presque Isle, Maine - 1996.

Variety	Total Yield cwt/A	US#1 Yield (cwt/A) >1 ⁷ / ₈ " % of std.	%	Stand (spacing) ²	50% Emerg. Date	Size Distribution by Class ³ (%)										Spec. Grav.
						1	2	3	4	5	6	1 ⁷ / ₈ to 4"	2 ¹ / ₄ to 4"	2 ¹ / ₂ to 4"		
<u>Medium Test- 110 days</u>																
Kennebec (std)	429	234	100	209	93(8)	6-12	2	11	17	46	21	2	95	84	67	1.089
Atlantic	429	347	148	292	98(10)	6-10	4	15	28	39	14	0	95	80	52	1.108
MaineChip	360	300	128	232	100(10)	6-13	4	22	38	35	1	0	96	74	36	1.102
Snowden	338	285	122	242	100(14)	6-12	4	14	25	46	10	0	96	81	57	1.109
AF1433-4	322	296	126	214	94(10)	6-12	6	26	39	26	3	0	94	68	28	1.081
B0564-8	389	334	142	259	100(10)	6-10	6	21	33	33	6	0	93	72	39	1.091
B0564-9	412	341	146	296	100(10)	6-11	4	13	23	47	13	0	96	83	60	1.098
B0585-5	383	227	97	210	96(8)	6-12	2	8	22	50	19	0	98	90	69	1.090
ND2417-6	427	269	115	203	100(10)	6-11	8	22	29	33	6	0	91	69	39	1.092
ND2471-8	385	242	103	187	100(10)	6-11	6	22	26	39	6	0	93	71	46	1.095
NY87	436	303	130	271	98(10)	6-12	3	10	24	47	15	2	96	86	62	1.086
NY102	368	330	141	284	100(10)	6-12	3	13	30	46	7	0	97	83	53	1.097
NY103	386	276	118	243	97(10)	6-15	4	11	24	51	10	0	96	85	61	1.086
W870	377	299	128	239	98(10)	6-12	4	19	38	36	2	0	96	76	39	1.107
Waller Duncan																
LSD (k=100)	64	82		74									3	6	9	0.006

¹U.S.#1 yield = yield 1⁷/₈ to 4" excluding external defects.

²Inches between seedpieces noted within parentheses.

³Size classes: 1=1¹/₂ to 1⁷/₈"; 2=1⁷/₈ to 2¹/₄"; 3=2¹/₄ to 2¹/₂"; 4=2¹/₂ to 3¹/₄"; 5=3¹/₄ to 4"; 6=over 4".

Maine Table 4. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for 14 medium-maturing, chipping varieties grown at Presque Isle, Maine - 1996.

Variety	Plant Data ¹		Tuber Data ¹		Tuber Defects (%)					Hollow			
	Size 8-19	Vine Matur. at 8-19	Matur. at vinekill	Skin Tex- ture	Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Rot	Heart Rating ²	Chip Color ³
Medium Test- 110 days													
Kennebec (std)	8		6.8	8	6	5	42.6	16.2	5.1	20.8	0.5	0	48dr
Atlantic	7	5	5.3	7	2	6	15.5	11.8	2.3	0.9	0.5	1	56
MaineChip	8	7	6.0	8	2	7	13.0	12.0	0.7	0.3	0.0	1	71
Snowden	8	7	5.8	6	2	4	11.8	7.6	3.3	1.0	0.0	3	63
AF1433-4	6	5	5.0	7	1	6	2.2	1.4	0.7	0.1	0.0	0	66
B0564-8	6	6	4.5	6	1	5	8.4	7.9	0.2	0.1	0.1	0	62
B0564-9	8	6	5.3	6	2	6	13.4	11.9	1.0	0.3	0.2	2	52
B0585-5	7	5	5.0	8	2	7	38.9	32.0	1.5	5.4	0.0	3	60dr
ND2417-6	7	5	5.0	8	3	6	31.5	24.7	4.6	1.8	0.4	0	62
ND2471-8	6	6	4.5	8	1	6	33.8	28.0	2.5	2.3	1.0	2	55dr
NY87	7	5	4.8	7	2	7	27.4	25.3	0.9	1.1	0.0	0	63
NY102	8	7	5.5	8	2	6	7.4	4.8	1.5	1.1	0.0	0/30	64
NY103	7	6	5.5	8	2	7	25.8	18.8	4.7	2.1	0.3	0/30	63
W870	7	6	4.8	8	4	4	16.9	10.7	4.6	1.6	0.0	0	63

¹See standard NE107 rating system for key to codes.

²Hollow heart rating equals the number of hollow tubers found per 40 large tubers cut and examined.

³Chip color -- Agtron M35 (higher values indicate lighter color): >60 acceptable; dr = dark vascular ring; bl = mod. to severe blistering. Waller Duncan LSD (K=100) for chip color = 5.

Maine Table 5. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for 11 medium-maturing, table varieties and 11 late-maturing varieties grown at Presque Isle, Maine - 1996.

Variety	Total Yield cwt/A	US#1 Yield (cwt/A) >1 7/8" % of std.	%	Stand (spacing) ²	50% Emerg. Date	Size Distribution by Class ³ (%)											Spec. Grav
						1	2	3	4	5	6	1 7/8 to 4"	2 1/4 to 4"	2 1/2 to 4"			
<u>Medium Test- 110 days</u>																	
Kennebec (std)	482	277	100	248	98(8)	2	10	18	50	17	3	94	85	67	1.091		
Atlantic	430	359	130	299	100(10)	3	16	28	46	6	1	96	80	52	1.106		
Cherry Red	300	243	88	203	100(10)	6	16	27	44	7	0	94	78	51	1.086		
Chieftain	446	403	145	353	100(10)	4	12	25	50	10	0	96	85	60	1.083		
Dark Red Norland	381	352	127	276	100(10)	4	20	34	40	1	0	96	75	41	1.072		
Draga	423	351	127	282	94(8)	6	18	27	37	11	1	93	75	48	1.082		
Quaggy Joe	476	370	134	313	97(10)	3	15	29	45	8	0	96	81	52	1.078		
Red Ruby	308	263	95	177	100(10)	7	30	41	20	2	0	93	63	22	1.085		
AF1425-1	318	221	80	172	99(10)	6	21	30	39	5	0	94	74	44	1.079		
AF1475-16	311	258	93	238	96(10)	2	8	22	51	17	1	97	90	68	1.079		
ND1871-3R	336	298	108	241	95(10)	5	19	26	43	6	1	94	76	49	1.083		
W. Duncan LSD	32	43		43								4	9	12	0.004		
<u>Late Test - 120 days</u>																	
Katahdin (std)	436	385	100	345	100(8)	3	10	19	51	16	1	95	86	67	1.086		
Latona	545	479	124	341	99(10)	8	26	36	26	3	0	92	65	29	1.085		
Lili	497	446	116	339	98(10)	7	22	34	35	1	0	93	70	36	1.085		
Matilda	334	257	67	86	100(10)	23	52	20	5	0	0	77	25	5	1.088		
Morene	453	411	107	339	99(10)	6	16	28	36	13	1	94	77	49	1.090		
Morning Gold	490	456	118	417	99(10)	2	8	19	45	23	2	96	88	68	1.090		
Niska	380	339	88	291	100(10)	4	14	33	41	9	0	96	83	50	1.089		
St. Johns	426	386	100	341	93(8)	3	11	24	46	15	1	96	85	61	1.081		
Yukon Gold	462	418	109	382	86(8)	3	8	15	48	25	2	95	87	72	1.091		
AF1455-9	439	399	104	338	98(10)	4	15	24	45	12	0	96	82	57	1.077		
AF1480-5	406	385	100	345	96(10)	3	10	23	49	15	0	97	87	64	1.085		
W. Duncan LSD	46	44		47								4	7	10	0.004		

¹U.S.#1 yield = yield 1 7/8 to 4" excluding external defects.

²Inches between seedpieces noted within parentheses.

³Size classes: 1=1 1/2 to 1 7/8"; 2=1 7/8 to 2 1/4"; 3=2 1/4 to 2 1/2"; 4=2 1/2 to 3 1/4"; 5=3 1/4 to 4"; 6=over 4".

Table 6. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip colors for 11 medium-maturing tablestock varieties and 11 late-maturing varieties grown at Presque Isle, Maine - 1996.

Variety	Plant Data ¹			Tuber Data ¹			Tuber Defects (%)					Hollow		
	Size 8-19	Vine Matur. at 8-19	Vinekill tuber	Matur. at 8-19	Skin Tex- ture	Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Rot	Heart Rating ²	Chip Color ³
Medium Test- 110 days														
Kennebec (std)	8	7	6.0	7	6	6	4	39.6	18.3	3.1	18.1	0.0	1	40dr
Atlantic	7	6	5.0	6	2	2	5	13.1	8.3	1.7	3.0	0.1	1	51
Cherry Red	6	6	5.0	dark red	7	2	7	14.0	10.2	1.8	1.5	0.5	1	34dr
Chieftain	7	5	4.5	pale red	7	3	6	6.4	4.3	0.2	2.0	0.0	0	24dr
Dark Red Norland	5	4	3.8	pale red	7	2	4	3.4	2.6	0.5	0.3	0.0	0	35dr
Draga	6	5	5.0	8	3	3	5	11.5	7.2	2.3	1.8	0.2	0	24dr
Quaggy Joe	7	6	5.3	8	4	4	4	19.2	13.7	3.7	1.7	0.1	0	25dr
Red Ruby	7	6	5.5	dark red	7	3	6	8.6	4.2	2.0	2.4	0.0	0	26dr
AF1425-1	7	6	5.3	8	3	3	7	26.0	24.7	0.7	0.6	0.0	0	46dr
AF1475-16	6	5	5.8	8	6	6	3	14.8	10.1	4.1	0.3	0.3	0	38dr
ND1871-3R	8	8	6.0	dark red	7	1	4	6.2	5.5	0.0	0.4	0.3	0	25dr
Late Test - 120 days														
Katahdin (std)	8	8	5.8	8	2	2	7	7.5	7.5	0.0	0.0	0.1	0	39dr
Latona	9	8	7.3	yel.	8	3	4	4.4	2.3	0.1	2.0	0.0	0	28dr
Lili	9	8	6.5	yel.	7	6	5	2.9	0.9	1.4	0.6	0.0	0	50dr
Matilda	9	8	7.5	yel.	6	4	2	1.0	0.7	0.4	0.0	0.0	0	40dr
Morene	9	8	6.3	8	6	6	5	3.2	2.7	0.2	0.3	0.0	0	37bl,dr
Morning Gold	9	7	4.5	yel.	8	2	7	3.3	0.7	1.4	1.0	0.3	1	32dr
Niska	7	6	5.0	6	3	3	5	7.5	4.1	0.3	3.2	0.0	0	58dr
St. Johns	8	7	6.0	7	3	3	6	5.3	3.9	0.6	0.8	0.0	0	36dr
Yukon Gold	8	7	3.8	yel.	7	2	7	5.1	4.3	0.4	0.3	0.0	0	28dr
AF1455-9	7	6	5.0	8	2	2	6	5.7	5.0	0.6	0.1	0.0	1	42bl,dr
AF1480-5	7	6	6.3	8	6	6	6	2.6	1.9	0.7	0.0	0.0	1	48dr

¹See standard NE107 rating system for key to codes.

²Hollow heart rating equals the number of hollow tubers found per 40 large tubers cut and examined.

³Chip color -- Agron M35 (higher values indicate lighter color): >60 acceptable; dr = dark vascular ring; bl = mod. to severe blistering. Waller Duncan LSD (K=100) for chip color = 4 (medium test) and 4 (late test).

Maize Table 7. French fry color and texture of selected potato clones and varieties under simulated processing conditions¹. All varieties were grown at Presque Isle, Maine, during 1995.

Variety	Color Grade ² Rating Index	Grayness ³ Index	Mealiness ⁴ Index	Comments ⁵	Overall Rating ⁶
Russet Burbank (std)	00	1.0	4.0	3.92	U
Century Russet	0	2.0	4.0	3.91	U
Goldrush	0	2.0	4.0	3.85	Be, Sh
Krantz	00	1.0	4.0	4.20	Be, Sh
Russet Norkotah	0	2.0	4.0	3.45	Be
Shepody	0	2.2	4.0	4.25	Be
AF1481-4	0	2.0	4.0	2.13	Be, Sh
B0493-8	0	2.0	4.0	3.10	Be, Sh
B9222-11	00	1.0	4.0	3.20	Be, Sh
W1099Rus	0	2.0	4.0	3.58	Be, Sh
Waller Duncan LSD (k=100)	0.2	NS	0.70		

¹Two center raw tuber slices were cut from each of ten tubers. The slices were rinsed in cool water, blanched for 8 minutes at 170°F, par-fried at 375°F for 80 seconds, and quick frozen at -30°C in plastic bags. Four such replications were processed on January 23, 1996 and held at -15°F until evaluation. Prior to evaluation, samples were finish-fried at 360°F for 2-1/2 minutes on January 30, 1996, blotted dry with a paper towel, and cooled for 6 minutes. Processing and evaluations were done by T. Work of the Department of Food Science, University of Maine, Orono, ME. All tuber samples were stored at 50°F, 85% R.H. from harvest until processing.

²Color Grades are from USDA color standards chart #64-1, third edition.

³Grayness indices represent weighted means derived from the following evaluation scale: 4 = no graying; 3 = slight graying; 2 = moderate graying; 1 = intense graying.

⁴Mealiness indices represent weighted means derived from the following evaluation scale: 5 = dry, mealy; 4 = mod. mealy, sl. moist; 3 = sl. mealy, mod. moist; 2 = soggy, not mealy; 1 = very soggy, not mealy.

⁵Comments: U = uniform fried color; Ir = french fries were irregular in color; dark blotches detracted from appearance of product; Be = Dark blotches on ends of many fries; Bc = Dark blotches in centers of many fries; Bl = general blotchy appearance of fries; Sh = Short fries from round tubers.

⁶Overall rating: quality rated better (+), not different (o), or poorer (-) than Russet Burbank.

Maine Table 8. Chip color from 38°F, 45°F, and 50°F storage, reconditioning potential, washed appearance ratings, days to sprout formation, and storage weight losses at 38°F and 50°F for 53 potato varieties grown at Presque Isle, Maine, during 1995 and stored during the 1995-1996 storage season.

Variety	Chip Color from Storage			After-Cooking Darkening ³	Washed Appearance Index ⁴	Days to Indic. Storage Wt.				
	50°F ¹	45°F ¹	38°F ¹			Recond. ²	Sprout Length ⁵ PIP 1/2"	Loss % ⁶ 38°F	50°F	
Early Trial:										
Superior	65	52	27	60	8.6	98(8) ^{SS,B}	114	149	4.5	15.7
Monona	74	--	--	67	8.9	95(6) ^{PC,SS,BD,SZ}	114	163	2.6	12.7
AF1331-2	59	41	19	44	8.5 ^{sl}	80(4) ^{PC,SB,SS,BS,B}	107	163	3.8	13.0
AF1424-6	73	70	60	66	8.2 ^{sl}	77(7) ^{PC,B,PL}	114	149	4.3	19.2 ^s
AF1424-7	71	70	58	67	8.7 ^{sl}	88(6) ^{SS,SZ}	93	149	5.2	31.8 ^s
AF1438-4	73	--	--	56	8.1	80(5) ^{PC,B,BD,SZ}	93	163	2.8	15.4
AF1438-5	67	--	--	49	8.3	71(5) ^{SS,SZ}	93	121	3.2	27.1 ^s
AF1438-6	48	--	--	34	8.2	87(7) ^B	93	121	1.6	21.0 ^s
AF1565-12	69	51	26	60	8.8 ^{sl}	85(6) ^{SS,B}	79	100	5.8	39.0 ^s
Waller Duncan LSD	3	5	4	4						
Medium Chipping Trial:										
Kennebec	59	57	36	65	8.9	98(7) ^{SB}	101	187	4.2	10.4
Atlantic	62	62	43	63	8.1 ^{sl,pc}	76(4) ^{PC,BS,B}	87	123	3.4	18.8
MaineChip	63	66	55	62	8.8 ^{sl}	87(6) ^{SS,B}	80	130	3.2	27.5 ^s
Snowden	58	63	56	61	8.2 ^{pc}	91(5) ^{B,SZ}	80	123	5.0	24.2 ^s
AF875-15	59	59	46	60	8.9	98(5) ^{PC,SS}	87	115	5.3	30.0 ^s
AF1433-4	61	61	43	64	8.7	91(6) ^{CS,BS,B}	66	108	3.5	17.1
AF1452-28	60	67	61	63	8.5	94(8) ^B	101	165	7.6	22.2
B0257-12	60	62	49	62	8.4	89(6) ^{PC,RS,BS}	87	115	2.7	30.4 ^s
B0564-8	59	64	55	64	8.7	90(5) ^{B,SZ}	73	115	6.0	29.1 ^s
B0564-9	63	68	53	64	8.9 ^{sl}	94(4) ^{PC,CS,RS,SZ}	80	158	4.3	19.1
B0585-5	64	69	52	64	8.9	42(4) ^{PC,GC,BS}	101	158	5.4	16.3
ND2417-6	63	68	57	64	8.3 ^{pc}	91(5) ^{SB,M,SZ}	66	108	4.2	21.6
ND2471-8	58	64	49	59	7.4 ^{sl,pc}	92(5) ^{PC,SS,B,SZ}	94	130	3.6	14.3
NY87	64	68	58	64	9.0	94(7) ^{BS}	80	151	4.2	16.4
W870	61	68	56	64	8.2 ^{pc}	87(4) ^{PL,SZ}	94	151	5.6	21.4 ^s
Waller Duncan LSD	2	2	4	3						

Maine Table 8 cont.

Variety	Chip Color from Storage		After-Cooking Darkening ³	Washed Appearance Index ⁴	Days to Indic. Storage Wt.						
	50°F ¹	38°F ¹			Sprout Length ⁵	Loss % ⁶					
	45°F ¹	Recond. ²			PIP	1/2"	38°F	50°F			
<u>Medium Table Trial:</u>											
Kennebec	63	60	41	67	8.5	99 (8) GR, SS, B	101	187	3.9	10.4	
Atlantic	66	61	43	66	8.3pc	81 (6) PC, BS, B, SZ	94	151	3.9	18.5	
Cherry Red	57	--	--	--	7.7pc, syl	96 (7) SS, SZ	101	151	2.8	18.3	
Chieftain	37	--	--	--	8.8	99 (7) PC, B, PL	108	158	2.5	13.5	
Dark Red Norland	57	--	--	--	8.5	84 (6) PC, BS, B	101	137	4.6	32.8s	
Quaggy Joe	44	36	19	39	8.5	94 (5) PC, SB, SS	73	123	5.0	21.8	
Red Ruby	37	--	--	--	8.5	85 (4) PC, SS, SZ	108	158	4.4	17.6	
AF1379-3	53	43	29	50	8.4	77 (6) SS, SZ	73	115	4.4	21.8s	
AF1425-1	64	61	40	65	8.0pc	94 (7) SB, SZ	73	123	2.5	16.1	
AF1426-1	68	56	37	61	8.4	99 (7) PC, GR, SS	101	180	4.1	8.5	
AF1470-18	59	57	35	64	8.6	80 (4) PC, CS, SS, BS, SZ	80	115	5.4	26.2s	
AF1475-16	58	53	34	64	8.0pc	92 (7) B	80	123	5.0	23.0s	
ND1871-3R	54	--	--	--	8.2	86 (5) PC, SZ	123	158	3.6	20.6	
Waller Duncan LSD	4	4	7	7							
<u>Late Trial:</u>											
Katahdin	59	50	28	64	8.8	85 (7) SS, BS	79	121	1.9	16.8	
Chipeta	63	58	29	61	8.5	94 (8) PC, SB	79	170	3.3	15.4	
Mainestay	56	--	--	--	8.4	89 (4) PC, SS, BS, SZ	65	93	4.8	27.8s	
Morene	50	43	23	54	8.0sl	95 (7) PC, SS, B	65	121	3.9	19.1	
St. Johns	48	--	--	--	9.0	72 (5) PC, SS, BS, B, SZ	79	121	5.2	26.1s	
AF1455-9	61	56	33	53	8.0pc	87 (5) SS, SZ	65	100	4.2	29.8s	
Waller Duncan LSD	4	5	3	4							

Maine Table 8 cont.

Variety	Chip Color from Storage			After-Cooking Darkening ³	Washed Appearance Index ⁴	Days to Indic. Storage Wt.		
	50°F ¹	45°F ¹	38°F ¹			Sprout Length ⁵	Loss %	
						PTP	1/2"	38°F 50°F
<u>Russet/Processing Trial:</u>								
Russet Burbank	49	42	27	55	8.6	80 (4) ^{H, NR, B, SZ}	65	185 2.5 10.9
Century Russet	36	34	20	38	8.9	94 (6) ^{NR, SB, B, PR, SZ}	65	156 3.8 13.8
Goldrush	48	38	24	55	8.7	94 (6) ^{BS, B, SZ}	65	107 4.5 24.3s
Krantz	54	54	26	60	8.1syl	99 (5) ^{SS, B, SZ}	58	100 4.3 26.0s
Russet Norkotah	52	41	25	55	8.6syl	77 (8) ^{BS, SZ}	65	156 3.8 14.2
Shepody	61	53	24	60	8.6	90 (7) ^{SB, SS}	65	121 2.9 19.2s
AF1481-4	50	42	20	52	9.0	92 (7) ^{B, SZ}	65	107 4.8 28.0s
B0493-8	36	29	17	38	8.7	86 (5) ^{BS, NR, PR}	65	107 2.9 27.0s
B9922-11	52	41	22	54	8.1pc	89 (8) ^{SB, FL}	65	107 2.0 21.2s
W1099Rus	56	46	29	64	8.6syl	88 (6) ^{SB, NR, SS, SZ}	58	107 3.8 27.7s
Waller Duncan LSD	5	5	4	4				

¹Stored at 38°F, 45°F, or 50°F, 85% R.H. from harvest until February to 26, 1996. Chip color scores are from an Agtron Model M-35 Process Analyzer (Agtron, Inc., Sparks, Nevada; calibrated with black disk "0" = 0 and white disk "90" = 90). Chips were crushed and reported values are means from four replicate samples. Each sample was read three times and was thoroughly mixed between readings. Higher numbers indicate lighter chip colors.

²Reconditioned samples were taken from 38°F and placed at 70°F for a 3-week period starting on January 15, 1996.

See Agtron description under footnote #1.

³Samples were stored at 45°F and 85% R.H. from harvest until January 21, 1996. They were then warmed to 65°F for five days. Tubers were diced and then blanched for 5 min, cooled to 120°F, and then rated after 30 min. with a Munsel Neutral Color Scale. Higher indices indicate lighter color. Key to codes: sl=sloughing was a defect in this sample; syl=slightly yellow; yl=yellow; pc=unusually poor overall color.

⁴Unreplicated samples weighing approximately 7500 grams were stored at 45°F and 85% R.H. until February 1 and 2, 1996. Tubers were then washed and graded. First number indicates % U.S.#1 grade tubers in sample. Numbers in parentheses indicate subjective appearance of the sample using standard NE107 codes. Codes indicate major external defects as follows: M=misshapen, NR=nonuniform russetting, PC=poor color, SB=sunburn, GC=growth cracks, CS=common scab, SS=silver scurf, RS=russet scab, DR=dry rot, SR=soft rot, BS=black scurf, LE=enlarged lenticles, B=bruises, BD=blackdot, PW=powdery scab, RA=red areas, SZ=small tuber size, FL=flat tubers, PR=pear shaped.

⁵Tubers were stored at 45°F, 85% R.H.

⁶Percentage sprout and weight loss following storage from harvest until March 27 to 28, 1996, at indicated temperature and 85% R.H. Codes "s" or "r" indicate heavily sprouted or spoiled samples, respectively.

MAINE

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University of Maine Potato Breeding Project

Objectives: The development of new potato varieties of three types: 1. high-yielding, round, white, fresh market varieties with good table qualities and resistance to scab; 2. round white chipping varieties with high dry matter and low sugars, especially after long term cold storage; and 3. russet varieties with high yield and high dry matter suitable for french fry processing and fresh market.

Seed and seedling production. A total of 42 parent plants were intercrossed in 63 different combinations to produce 33,935 seeds. An additional 3,015,085 seeds were obtained from 65 field plantings. Greenhouse plantings of 292,440 true seeds yielded 66,251 seedlings from which 36,699 tubers were harvested.

Seedling selection. A total of 252 (1.2%) new selections were saved from 21,430 single hills. From the 365 12-hill plots, 53 (14.5%) were saved for further testing. Twenty-seven of 45 60-hill plots were selected, and 158 advanced selections were maintained and tested.

Disease tests. In cooperation with Drs. David Lambert, Richard Storch, Bill Brodie, Robert Goth, Barbara Otrysko, John Wells, and Simeon Leach, a number of selections were

tested for resistance to several diseases. All tests were inoculated either directly or on spreader rows within the plots. Results were as follows: 3 of 4 were resistant to corky ring spot; 26/105 to acid scab; 41/104 to common scab; 25/60 to verticillium; 15/44 to golden nematode; 13/120 to late blight; 14/28 to leafroll; and 92/104 to net necrosis.

Physiological disorders.

Additional tests for physiological disorders showed 15 of 55 resistant to hollow heart; 18/39 to blackspot bruising; and 31/48 to shatter bruising.

Chip tests. After processing in December and February, from five storage temperatures, eleven entries had better chip color than Monona: AF 1424-6, AF 1424-7, AF 1433-4, AF 1668-60, AF 1668-62, CS 7232-4, ND 860-2, W 91-982b, MaineChip, Snowden, and Somerset.

Cooking tests. Terry Work, Food Sciences, University of Maine, Orono, conducted boil and baked quality tests for six selections from the 1995 plantings. Two were better than standards overall.

Commercial Trials. Along with MaineChip, Mainestay, Portage, Quaggy Joe and St.Johns, seven selections were grown on commercial farms in 1996: AF 875-15, AF 1426-1, AF 1433-4, AF 1475-16, AF 1438-6, AF 1481-4, and AF 1565-12.

Advanced Selections

Chipping selections:

MaineChip (AF 875-16; AF 186-2 x AF 84-4) was named in 1991. It is a high dry matter, cold-

chipping variety, with yields of marketable size, specific gravity and chip color equal to Snowden. Commercial seed is not being produced even though one or two chip growers have had success with this variety.

AF 875-15, a sibling of MaineChip, has better yields than MaineChip and equal dry matter, but is not as good after cold storage. It is a good chipper from the field and does not show the heat necrosis that Atlantic does. Hollow heart is very rare, but growth cracks have been a problem in commercial fields.

AF 1433-4 (AF 811-8 x CS 7232-4) is being grown commercially as an early chipper. Its gravity is not high, and it does not have good chip color after December, but yields are fairly good.

Round white table varieties:

Portage (CS 7697-24; Raritan x BR 6831-5) is an early maturing variety with high yields and low gravity. It was named in 1992. Its advantage over Superior is better resistance to verticillium and rhizoctonia. Disadvantages: susceptibility to scab and purple streaking, and skinning at harvest.

St. Johns (AF 828-5; BR 6317-21 x CC 14-3a) is a late maturing variety with high yields and good disease reactions. It is resistant to golden nematode and the corky ring spot virus, and does well all along the east coast. Two commercial growers have had trouble storing it, but yields and quality were good. It has a good washed appearance.

Mainstay (AF 431-9 open pollinated) is slightly higher yielding than St. Johns, but is more susceptible to scab. It has also shown purple streaks on occasion. It is difficult to kill, and if dug green can give problems in storage. High yields and good size are its best qualities.

Quaggy Joe (CS 7589-8 x Portage) is a very high-yielding variety with good appearance and table quality. Problems seen so far have been hollow heart, purple streaks, and pressure bruising. These problems were not present in 1996 commercial plantings.

AF 1565-12 (AF 303-5 x Sunrise) is a round white table variety with good size, appearance and yields. It is early maturing and resistant to golden nematode, verticillium and scab. Specific gravity is low and cooked texture is rated low, but overall ratings equal Superior.

AF 1426-1 (AF 637-1 x AF 564-2) is an early selection with yields equal to Superior and good table qualities. Growth cracks have sometimes been a problem. Yield and appearance in 1996 were not good enough to continue this selection.

AF 1475-16 (AF 303-5 x Portage) is an early maturing selection with moderate yields, but poor shaped tubers. Its performance in 1996 was not good enough to continue testing.

AF 1438-6 (AF 686-3 x Portage) is a medium-early maturing selection. One commercial grower planted it in 1996. Yields have been very high, but growth cracks may be a problem for this selection.

Russets:

AF 1481-4 (CS 7966-7 x SA 8207-3) is the only russet with commercial test results. Its yields have been rather low and it is a blocky type, rather than long. This one will be discontinued.

Michigan Potato Variety Evaluations

D.S. Douches, R.W. Chase, K. Jastrzebski, R. Hammerschmidt, W. Kirk, C. Long, K. Walters, and J. Coombs

The objectives of the evaluations are to identify superior varieties for fresh market or for processing and to develop recommendations for the growing of those varieties. The varieties were compared in groups according to the tuber type and skin color and to the advancement in selection. Each season, total and marketable yields, specific gravity, tuber appearance, incidence of external and internal defects, chip color (from field, 45 and 50 F storage), dormancy (at 50F), as well as susceptibilities to common scab, *Fusarium* dry rot, *Erwinia* soft rot and blackspot bruising are determined. We are now in the process of integrating late blight resistance testing into the evaluation procedure.

Six field experiments were conducted at the Montcalm Research Farm in Entrican, MI. They were planted in randomized complete block design with four replications. The plots were 23 feet long and spacing between plants was 12 inches. Inter-row spacing was 34 inches. Supplemental irrigation was applied as needed.

Both round and long variety groups were harvested at two dates. They are referred to as the Date-of-Harvest trials. The other two field experiments were the North Central Regional and European trials. In each of these trials the yield was graded into four size classes, incidence of external and internal defects in > 3.25 in. diameter or 10 oz. potatoes were recorded, and samples for specific gravity, chipping, dormancy, disease tests, bruising and cooking tests were taken. Chip quality was assessed on 25-tuber samples, taking two slices from each tuber. Chips were fried at 365°F. The color was measured visually with the SFA 1-5 color chart. Tuber samples were also stored at 45 or 50°F for chip-processing out of storage in January and March.

Round White Varieties

Seven varieties and 13 breeding lines were compared at two harvest dates. Atlantic, Snowden and Onaway were used as checks. The average yield as well as specific gravity levels were typical. The results are presented in Tables 1 and 2. In the early harvest trial (94 days), AF1470-17 (Quaggy Joe), NY101, Onaway and Atlantic had the highest yields of the 20

entries. At the later harvest (140 days), AF1470-17 and NY101 were still the top yielders. The MSU advanced seedling, MSB107-1 was third highest at 450 cwt/A, 52% higher than at the early harvest. Internal defects within the trial were variable, however vascular discoloration was more prevalent than in previous years.

Variety characteristics. *Mainstay* (AF1060-2) - late, fresh market variety of high yield potential and excellent internal quality, but low specific gravity. It is susceptible to scab. *Mainstay* performed above average in the trials but has shown higher yield potential in some on-farm trials, but may have sticky stolons at harvest.

St. Johns - medium-late fresh-market variety of above average yield potential, but low specific gravity. There was some variation in shape, but general appearance was good with large tubers and excellent internal quality. It is susceptible to scab infection.

MSB076-2 - this MSU selection has high yield potential, has very high specific gravity, acceptable chip quality and resistance to scab. It is between Atlantic and Snowden in maturity and we observed, in some instances, a tendency for hollow heart in oversize tubers. It has a large and upright vine type.

NorValley (ND2417-6) - a cold-chipping selection with above average yield potential, but moderate specific gravity. It has performed well in regional trials, but it is susceptible to scab.

NY103 - a chip-processing/fresh market selection from New York which has high yield potential, excellent internal quality and smooth, bright appearance, but the specific gravity may be too low for chip-processing. NY103 is equivalent to Atlantic for scab reaction. This selection has had excellent yield potential in on-farm trials.

NY101 - a light-yellow-fleshed selection from New York. This line has an excellent shape, with netted tubers and very high yield potential. It is resistant to scab. In general, internal defects are low, but in 1995 we observed IBS in the oversize tubers.

Pike (E55-35) - an average yielding selection from New York. It chip-processes well and is resistant to scab similar to Superior. At times it has shown IBS in the tubers.

MSB083-1 - an MSU selection with a bright round appearance. This selection is in grower trials and its performance has been variable. IBS was noted in the oversize tubers for the first time.

MSB107-1 - an MSU selection for the tablestock market. It is bright-skinned with large, round tubers with excellent internal quality. This selection performed well in grower trials in 1996.

MSA091-1 - an MSU selection for chip-processing. Yields

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have been variable, but it has some scab resistance.

Quaggy Joe (AF1470-17) - a high yielding tablestock selection from Maine. It produces large tubers, but is highly susceptible to scab. Brown centers were observed in the oversize tubers in 1996.

NY111 - a New York selection with chip-processing potential. It had average yield and equivalent to Atlantic in scab susceptibility.

Long Varieties

Five varieties and eight breeding lines were tested. Russet Burbank, Shepody and Goldrush were grown as check varieties. The first date-of-harvest trial was dug 107 days from planting rather than 94 days to give the trial greater time to bulk. Most of the entries in the long-type trial were late maturing resulting in low yields and small tuber size at the first date-of-harvest (Table 3). At the second harvest on September 23 (140 days), yields for all entries had increased substantially (Table 4). Yield and specific gravity values were higher than 1995. Within the 13 long-type entries, Century Russet and A7961-1 produced the highest yields at 107 days. Most of these entries have a late maturity, so tuber sizing is generally small. At the later harvest (140 days), Century Russet, JS111-28, Shepody and Russet Burbank produced yields greater than 300 cwt/A. Hollow heart was the most significant internal defect and was greatest in MSB106-8 and C082142-4.

Variety characteristics. *Century Russet* - a russet variety from Oregon with high yield potential. It has excellent internal quality and bulks early despite a late vine maturity. It is susceptible to scab.

JS111-28 - provided by J.R. Simplot. JS111-28 has high yield potential with good general appearance, good russetting and shallow eyes. It is a somaclonal derivative of Lemhi Russet selected for lower incidence of blackspot bruise. It is also highly scab resistant.

A7961-1 - is an USDA-Aberdeen entry with above average yield. It has uniform appearance, heavier russetting than Russet Burbank and minimal internal defects. It can be used for frozen-processing.

A082611-7 - this selection was below average in 1996. It is reported to have some resistance to early dying. Tuber shape is long but tuber width is narrow. Many pickouts were observed in 1996.

Legend (COO83008-1) - is an Oregon selection from the Colorado breeding program. Yields were below average in 1995 and 1996. The tubers were well shaped with good type.

Newleaf Russet Burbank - a variety from NatureMark which expresses the Bt gene for beetle control. Yield was below average this year despite good vine growth.

North Central Regional Trial

The North Central Trial is conducted in a wide range of environments, in 9 states to provide adaptability data for the release of new varieties from North Dakota, Minnesota, Wisconsin, and Michigan. Ten breeding lines and seven varieties were tested in Michigan. The results are presented in Table 5. The range of yields were wide. The MSU selections, *MSB076-2* and *MSB106-7*, performed well. *W1313*, a Wisconsin seedling, had the highest yield but had almost one-third of its oversize tubers with hollow heart. The Minnesota selection, *MN16489*, had a high overall merit in the trial, but it has a bluish skin which may limit its marketability. The North Dakota seedling, *ND2676-10*, has a nice appearance, some possible scab resistance and a good chip score, but it had below average yield and a specific gravity under the industry standards.

European Trial

Fourteen European varieties and advanced selections were tested along with three yellow-fleshed MSU seedlings. Yukon Gold, Michigold and Saginaw Gold were used as checks. The results are summarized in Table 6. Most of the European selections and varieties were late to very-late in maturity and many of these lines produced a small percentage of oversize tubers. *Picasso*, *Latona*, *Morning Gold* and *Lily* had yields over 500 cwt/A of US No. 1 potatoes. *Erntestolz*, *SW88-112*, *SW88-113* and *MSA097-1Y* were the entries which exceeded 400 cwt/A. Internal defects were not serious except for 32% hollow heart in the oversize tubers of *Morning Gold*. The rose-skinned, yellow-fleshed selection from MSU, *Julianna Rose (MSD040-4RY)*, has excellent eating quality and may fit well in a roadside stand or specialty market. Many of the European entries are oval to oblong in shape and off-white to yellow flesh colors.

Post-harvest Disease Evaluation: Fusarium Dry Rot and Erwinia Soft Rot

As part of the postharvest evaluation, resistance to *Fusarium sambucinum* (fusarium dry rot) was assessed by inoculating 10 whole tubers post-harvest from each line in the variety trials. The tubers were held at 20°C for approximately three weeks and then scored for disease incidence and severity of the dry rot infection. In the first round of testing 55 out of 150 entries showed little to no infection. Many of these lines were diploid selections from the germplasm enhancement program. These lines with little infection will be retested to discriminate resistant lines from escapes.

Erwinia soft rot tests were conducted on tuber slices this fall. Most selections from the trials were tested along with somatic fusion hybrids from Dr. J. Helgeson which were noted to have some resistance to soft rot. All lines tested in 1996 had moderate to heavy levels of soft rot. Moderate rot levels were observed in 22 of the 150 lines. These lines will be retested.

Potato Scab Evaluation

Each year a replicated field trial at the MSU Soils Farm is conducted to assess resistance to common and pitted scab. The varieties are ranked on a 1-5 scale based upon a combined score for scab coverage and lesion severity. Usually examining one year's data does not indicate which varieties are resistant but it should begin to identify ones that can be classified as susceptible to scab. Our goal is to evaluate important advanced selections and varieties in the study at least three years to obtain a valid estimate of the level of resistance in each line. We now have had three years of good trials (i.e. high levels of infection in susceptible lines).

Table 7 summarizes the 1994-6 scab trial results for the lines in these trials. Many russet lines showed resistance to scab infection with Century Russet an exception to this trend. The MSU lines, MSE192-8Rus and MSE202-3Rus, showed some resistance to scab in 1996. Some round white tablestock clones have resistance such as Superior, Onaway, Prestile, MSB040-3, and MSE221-1. Yellow-fleshed selections with resistance are NY101, MSE048-2y and MSA097-1y. Scab resistance was also identified in the chip-processing clones Pike and MSU selections MSB076-2, MSA091-1, MSB073-2, and MSNT-1.

Blackspot Susceptibility

Increased evaluations of advanced seedlings and new varieties for their susceptibility to blackspot bruising has been implemented in the variety evaluation program. Check samples of 25 tubers were collected (a composite of 4 reps) from each cultivar at the time of grading. A second 25 tuber sample was similarly collected and was placed in a hexagon plywood drum and tumbled 10 times to provide a simulated bruise. Both samples were peeled in an abrasive peeler in October and individual tubers were assessed for the number of blackspot bruises on each potato. These data are shown in Table 8.

Section A summarizes the data for the samples receiving the simulated bruise and Section B, the check samples. The bruise data are represented in two ways: percentage of bruise free potatoes and average number of bruises per tuber. A high percentage of bruise-free potatoes is the desired goal; however, the numbers of blackspot bruises per potato is also important. Cultivars which show blackspot incidence of 3 or more spots per tuber from the simulated bruise are approaching the bruise-susceptible rating. In addition, the data is grouped by trial, since the bruise levels can vary between trials. These results become more meaningful when evaluated over 3 years which reflects different growing seasons and harvest conditions. Bruising was more severe in 1996 than in 1995.

Late Blight Trial

In 1996 a late blight trial was conducted at the MSU Soils

Farm in East Lansing. Over 150 entries were evaluated in replicated plots. The field was inoculated on July 30 and ratings were taken during August and September. Most lines were highly susceptible to the US-8 genotype of late blight. Lines with the least infection were AWN86514-1, B0767-2, B0718-3 and Zarevo. Lines that showed slower infection spread were Libertas, Pimpernel, Hampton, Island Sunshine, Lily, Matilda, MSA091-1, MSB110-3, Ontario and Picasso.

Michigan Table 1. Round whites: early harvest, Montcalm Research Farm, August 8, 1996 (94 days).

Line	<u>Cwt/a</u>		<u>Percent of Total¹</u>						<u>Tuber Quality²</u>				Total cut	3-yr ave
	US#1	Total	US#1	Bs	As	OV	PO	SP GR	HH	VD	IBS	BC		
AF1470-17	335	388	86	13	74	12	1	1.063	0	0	0	1	39	-
NY101	314	360	87	13	86	2	0	1.069	0	0	0	0	31	339*
ONAWAY	296	330	90	10	84	6	1	1.070	0	0	0	0	40	281
ATLANTIC	266	310	86	13	81	5	1	1.085	8	0	1	0	40	280
NY103	253	288	88	12	82	6	0	1.071	2	0	0	0	40	311*
NY111	247	308	80	20	80	0	0	1.084	3	0	0	0	40	-
ST. JOHNS	241	286	84	15	84	0	1	1.066	0	0	0	0	40	286
MSB076-2	240	281	85	14	84	2	1	1.076	1	0	0	0	40	261*
MAINESTAY	240	309	78	22	76	2	0	1.073	0	0	0	0	40	282
AF1426-1	236	288	82	5	69	13	13	1.072	0	0	0	0	40	312*
FL1833	228	261	88	12	81	7	0	1.081	3	0	0	0	40	267
MSB107-1	217	239	91	8	84	7	1	1.069	3	0	0	0	40	200*
FL1863	216	243	89	11	77	12	0	1.078	0	0	0	0	40	274*
FL1867	215	272	79	21	78	1	0	1.090	7	0	1	1	40	-
MSA091-1	203	244	83	17	81	2	0	1.081	0	0	0	4	40	-
MSB083-1	202	272	74	25	74	1	1	1.075	0	0	0	0	31	199*
PIKE	192	238	81	19	78	3	1	1.082	2	0	1	0	40	207*
SNOWDEN	178	234	76	23	73	3	1	1.085	2	0	0	2	40	212*
ND2417-6	172	263	65	34	65	0	1	1.075	0	0	0	0	40	252
FL1887	137	167	82	17	80	2	1	1.070	0	0	0	1	40	-
MEAN	231	279						1.076						
LSD (0.05)	48	50						0.006						

¹Size: B - <2", A - 2-3.25", OV - >3.25", PO - Pickouts

²Quality: HH - Hollow Heart, BC - Brown Center, VD - Vascular Discoloration, IBS - Internal Brown Spot

*Two-year US #1 average

Planted May 6, 1996

Michigan Table 2. Round whites: late harvest, Montcalm Research Farm, September 23, 1996 (140 days).

Line	Cwt/a		Percent of Total ¹					Tuber Quality ²					Total	Scab ³	Mat ⁴	3 yr ave	
	US#1	Total	US#1	Bs	As	OV	PO	SP	GR	SFA	HH	VD	IBS				BC
AF1470-17	463	517	90	10	73	17	1	1.062	-	1	1	1	11	40	4.0	1.8	459*
NY101	463	495	93	6	70	23	1	1.070	1.5	0	1	4	0	40	1.0	3.5	534*
MSB107-1	450	462	97	2	50	47	1	1.076	-	1	3	1	0	40	2.5	4.0	386*
FL1887	405	429	94	4	46	49	2	1.080	1.0	0	14	7	0	40	3.0	4.5	-
ATLANTIC	403	438	92	6	61	31	1	1.086	1.5	10	0	2	0	40	3.5	3.3	437
FL1833	399	420	95	4	73	22	0	1.084	1.0	9	2	2	0	40	1.5	3.1	429
MAINESTAY	397	473	84	14	73	11	2	1.074	-	0	1	0	0	40	4.5	2.0	438
NY103	384	415	93	7	71	21	0	1.069	1.5	0	2	0	0	40	3.0	1.6	454*
NY111	374	417	90	10	82	8	0	1.083	1.0	6	2	1	0	40	3.0	2.0	-
ST. JOHNS	367	405	91	9	76	15	0	1.069	-	0	6	0	0	40	4.0	2.5	401
MSB076-2	367	403	91	8	82	9	1	1.086	1.5	2	1	0	0	40	1.5	2.5	395
MSB083-1	366	432	85	15	81	4	0	1.077	1.5	0	9	0	1	40	3.0	3.3	382*
SNOWDEN	357	409	87	12	79	9	1	1.082	1.0	2	11	0	0	40	3.0	2.8	396
AF1426-1	340	407	84	5	50	34	11	1.071	-	0	9	0	2	40	1.0	2.8	370*
ONAWAY	339	375	90	9	77	14	1	1.065	-	0	1	0	0	40	1.5	1.0	359
FL1863	335	349	96	4	75	21	0	1.081	1.0	1	1	2	0	40	2.0	2.5	401*
MSA091-1	317	357	89	9	73	16	2	1.081	1.5	0	5	2	0	40	1.0	3.1	-
PIKE	305	344	89	11	82	7	0	1.086	1.0	1	1	9	0	40	1.5	3.3	308
ND2417-6	300	387	78	22	74	4	1	1.074	1.5	0	1	0	0	40	3.5	1.5	370
FL1867	261	310	84	16	80	4	0	1.086	1.0	4	0	0	0	40	2.0	1.6	-
MEAN	370	412						1.077									2.6
LSD (0.05)	55	53						0.002									0.6

¹Size: B = <2", A = 2-3.25", OV = >3.25", PO = Pickouts²Quality: HH - Hollow Heart, BC - Brown Center, VD - Vascular Discoloration, IBS - Internal Brown Spot³Scab Rating 1996 from Scab Trial: 1 = no infection, 3 = intermediate, 5 = highly susceptible⁴Mat (Maturity): 1 = early, 5 = late

*Two-year US #1 average

Planted May 6, 1996

Michigan Table 3. Long types: early harvest, Montcalm Research Farm, August 21, 1996 (107 DAYS).

Line	Cwt/a		Percent of Total ¹						Tuber Quality ²				Total cut	3-yr ave
	US#1	Total	US#1	Bs	As	OV	PO	SP GR	HH	VD	IBS	BC		
CENTURY RU	377	491	77	23	66	11	0	1.072	1	0	0	0	40	253*
A7961-1	330	414	80	16	56	24	5	1.071	0	0	0	0	40	212
A082611-7	288	437	66	19	45	21	15	1.073	3	0	0	0	40	217
JS111-28	284	370	77	18	58	19	5	1.072	4	0	0	0	40	221*
SHEPODY	280	348	80	13	44	37	7	1.069	5	0	0	1	40	238*
GOLDRUSH	267	333	80	19	62	18	1	1.065	0	0	0	0	40	201
R. BURBANK	261	390	67	31	59	8	2	1.073	0	0	1	1	40	170
C0083008-1	220	281	78	19	67	11	2	1.074	1	0	0	2	40	168
C082142-4	209	253	82	16	57	26	2	1.068	7	0	1	0	40	-
A84118-3	188	260	72	24	58	14	3	1.073	10	0	0	0	40	118*
MSB106-8	187	244	77	20	49	28	3	1.073	15	0	0	0	40	-
NEWLEAF	164	294	56	41	53	3	3	1.069	1	0	0	1	40	-
C081082-1	81	139	59	39	53	5	3	1.065	1	0	0	0	30	-
MEAN	241	327						1.071						
LSD (0.05)	80	90						0.003						

¹Size: B = <2", A = 2-3.25", OV = >3.25", PO = Pickouts

²Quality: HH - Hollow Heart, BC - Brown Center, VD - Vascular Discoloration, IBS - Internal Brown Spot

*Two-year US #1 average

Planted May 6, 1996

Michigan Table 4. Long types: late harvest, Montcalm Research Farm, September 23, 1996 (140 days).

Table 1. Long-term data for US#1, A7961-1, A84118-3, A082611-7, C0083008-1, C081082-1, C082142-4, C08214																
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¹Size: B = <4 oz., A = 4-10 oz., OV = >10 oz., PO = Pickouts²Quality: HH - Hollow Heart, BC - Brown Center, VD - Vascular Discoloration, IBS - Internal Brown Spot³SCAB Rating 1996 from Scab Trial: 1 = No infection, 2 = Intermediate, 5 = Highly susceptible⁴Maturity: 1 = Early, 5 = Late

*Two-year US #1 average

Planted May 6, 1996

Michigan Table 5. North Central Regional Trial, Montcalm Research Farm, September 16, 1996 (132 days).

Line	Cwt/a		Percent of Total ¹					SP GR	SFA	Tuber Quality ²				Total cut	Scab ³	Mat ⁴	Merit rating
	US#1	Total	US#1	Bs	As	OV	PO			HH	VD	IBS	BC				
W1313	457	496	92	6	69	23	2	1.095	1.5	13	1	0	2	40	2.5	4.0	5
MSB106-7	424	505	84	14	65	19	2	1.071	3.0	0	1	2	0	40	3.0	2.8	4
MSB076-2	389	459	85	13	81	4	2	1.094	1.5	3	0	0	0	40	1.5	3.0	1
RED PONTIAC	374	415	90	6	47	43	4	1.064	4.0	9	1	0	0	40	4.0	3.8	
ATLANTIC	345	387	89	8	73	16	2	1.092	1.5	20	0	3	1	40	3.5	3.5	
MN16489	313	361	87	12	82	5	1	1.075	1.5	0	0	0	0	40	2.0	2.0	2
NORLAND	313	352	89	9	83	6	2	1.063	3.5	2	0	2	0	40	2.0	1.3	3
W1242	299	330	91	8	80	10	2	1.085	1.5	14	0	0	1	30	3.0	4.0	
MSB007-1	296	345	86	13	74	12	1	1.070	2.5	0	0	0	0	40	4.0	3.8	
R.BURBANK	280	401	70	18	53	16	13	1.082	3.5	12	0	3	0	40	1.0	4.3	
SNOWDEN	277	330	84	12	73	11	5	1.086	1.5	1	2	0	0	30	3.0	3.0	
ND2676-10	273	329	83	16	79	4	1	1.076	1.5	1	1	1	3	30	1.5	3.0	
NORCHIP	271	334	81	18	77	4	1	1.077	1.5	1	2	1	0	40	3.0	3.0	
ND2225-1R	250	334	75	24	74	1	1	1.065	3.0	0	1	1	0	40	2.0	1.8	
W1151RUS	228	286	80	20	60	19	0	1.065	3.0	0	0	0	0	30	1.5	3.8	
MN16180	228	340	67	32	65	2	1	1.072	2.0	6	0	2	2	40	3.0	2.0	
RNORKOTAH	149	235	63	35	58	5	2	1.070	3.5	2	0	1	0	40	-	1.5	
MEAN	304	367						1.077									3.0
LSD (0.05)	82	81						0.002									

¹Size: B = <4 oz., A = 4-10 oz., OV = >10 oz., PO = Pickouts²Quality: HH - Hollow Heart, BC - Brown Center, VD - Vascular Discoloration, IBS - Internal Brown Spot³SCAB Rating 1996 from Scab Trial: 1 = No infection, 2 = Intermediate, 5 = Highly susceptible⁴Maturity: 1 = Early, 5 = Late

*Two-year US #1 average

Planted May 7, 1996

Michigan Table 6. European Trial, Montcalm Research Farm, September 19, 1996 (136 days).

Line	Cwt/a		Percent of Total ¹					SP GR	SFA	Tuber Quality ²				Total cut	Scab ³	Mat ⁴	Merit rating
	US#1	Total	US#1	Bs	As	OV	PO			HH	VD	IBS	BC				
PICASSO	586	636	92	6	59	33	2	1.065	3.5	2	0	0	0	40	1.5	3.8	2
LATONA	541	658	82	16	78	4	2	1.075	-	3	1	1	0	40	-	4.3	
MORNING GOLD	528	599	88	10	74	14	2	1.071	-	13	0	4	2	40	-	3.3	5
LILI	528	629	84	14	74	10	2	1.070	-	2	2	2	0	40	4.5	4.5	
SW88-112	485	540	90	10	78	12	0	1.067	2.5	1	2	1	0	40	3.5	2.8	
ERNTESTOLZ	453	531	85	14	82	3	1	1.086	2.0	5	0	1	0	40	-	3.5	1
SW88-113	432	503	86	14	72	13	1	1.066	2.5	0	0	1	0	40	2.0	3.0	3
MSA097-1Y	412	442	93	7	73	20	0	1.072	-	0	0	2	0	40	2.0	2.3	
MATILDA	379	523	72	26	71	2	2	1.081	-	0	1	0	0	40	2.0	4.0	4
AMINCA	377	497	76	23	75	1	1	1.072	2.5	1	0	0	0	40	4.0	3.0	
DITTA	372	545	68	29	65	3	3	1.069	2.5	1	0	0	0	40	2.0	4.4	
ROMINA	360	465	77	21	74	3	2	1.068	1.5	1	2	2	0	40	4.0	1.8	
SAGINAW GOLD	341	392	87	11	81	6	2	1.071	1.5	0	0	1	0	40	2.5	1.8	
FELSINA	331	432	77	20	76	0	3	1.080	3.0	0	1	0	0	40	5.0	3.0	
YUKON GOLD	330	372	89	10	74	15	1	1.076	2.0	4	0	1	4	40	2.0	1.0	
PREMIERE	312	436	72	26	70	1	3	1.076	2.5	0	1	0	0	40	3.5	2.0	
MICHIGOLD	269	331	81	18	74	7	0	1.074	-	8	2	1	0	40	4.0	2.0	
MSD029-3Y	245	312	78	21	78	0	0	1.072	-	0	0	0	0	40	3.0	1.0	
IS. SUNSHINE	230	282	81	18	79	2	1	1.074	-	0	0	1	1	40	4.5	3.8	
MSD040-4RY	212	283	75	25	73	2	0	1.084	-	0	0	0	0	20	4.0	1.8	
MEAN	386	470						1.073									2.8
LSD (0.05)	81	80						0.010									0.8

¹Size: B= <4 oz., A = 4-10 oz., OV = >10 oz., PO = Pickouts²Quality: HH - Hollow Heart, BC - Brown Center, VD - Vascular Discoloration, IBS - Internal Brown Spot³SCAB Rating 1996 from Scab Trial: 1 = No infection, 2 = Intermediate, 5 = Highly susceptible⁴Maturity: 1 = Early, 5 = Late

*Two-year US #1 average

Planted May 7, 1996

Michigan Table 7. 1994-96 scab trial results, MSU Soils Farm.

Line	1994 Rating ¹	1995 Rating	1996 Rating	Line	1994 Rating	1995 Rating	1996 Rating
A082611-7	2.5	1.0	1.0	MSB076-2	1.0	1.5	1.5
A7961-1	1.0	1.0	1.0	MSB083-1	1.5	2.5	3.0
A84118-3	-	1.5	1.0	MSB094-1	2.0	-	3.0
A8495-1	1.5	1.0	-	MSB095-2	2.0	3.0	-
AC PTARMIGAN	1.5	1.5	-	MSB0952-1	2.0	-	2.5
AF1426-1	-	1.5	1.0	MSB106-7	1.0	-	3.0
AF1433-4	1.0	-	3.0	MSB106-8	2.5	1.0	-
AF1470-17	4.0	4.0	4.0	MSB107-1	2.5	2.5	2.5
AF875-15	2.0	-	4.0	MSB110-3	1.5	3.0	4.5
AGRIA	3.5	3.5	-	MSB1254-1	2.5	-	4.0
AMINCA	-	-	4.0	MSC010-20Y	-	1.5	2.0
ATLANTIC	2.5	3.0	3.5	MSC098-2	2.0	-	3.5
ATX 85404-8	-	-	3.0	MSC103-2	3.0	-	2.0
B0717-1	-	1.0	-	MSC120-1Y	1.0	-	2.5
B9922-11	1.0	1.0	-	MSC121-7	3.0	-	4.0
BC0894-2	-	-	2.0	MSC122-1	1.5	-	1.5
BRODICK	1.0	-	-	MSC125-8	1.0	-	2.0
C0008011-5	1.0	1.0	-	MSC126-6	2.5	-	1.0
C0083008-1	1.0	1.0	1.0	MSC148-A	-	2.5	2.5
C081082-1	-	-	3.0	MSD029-3Y	-	-	3.0
C082142-4	-	-	4.0	MSD040-4RY	3.0	2.0	4.0
CENTURY RUSSET	2.5	-	3.5	MSE007-8	-	1.0	-
CHALEUR	1.5	3.0	-	MSE011-25	-	2.0	-
DITTA	-	-	2.0	MSE011-7	-	1.5	4.5
ESTIMA	4.0	4.0	-	MSE018-1	-	3.5	3.0
FELSINA	-	-	5.0	MSE041-1	-	3.0	3.5
FL1533	2.5	3.0	-	MSE048-1Y	-	2.0	-
FL1833	3.0	2.0	1.5	MSE048-2Y	-	1.5	2.0
FL1863	-	3.0	2.0	MSE149-5Y	-	-	2.0
FL1867	-	-	2.0	MSE192-8	-	1.0	-
FL1887	-	-	3.0	MSE202-3	-	-	2.0
GOLDRUSH	1.5	1.0	1.0	MSE220-3	-	-	3.5
HINDENBURG	-	-	1.0	MSE221-1	-	1.5	1.0
ISLAND SUNSHINE	-	2.5	4.5	MSE222-5Y	-	2.0	-
JS111-28	-	-	1.0	MSE222-8	-	1.0	-
LEMHI RUSSET	1.0	1.0	-	MSE226-4Y	-	1.5	1.5
LILI	-	2.0	4.5	MSE228-1	-	2.0	-
MAINESTAY	4.0	3.0	4.5	MSE228-3-1.0171-8	4.0	3.5	5.0
ND2676-0	-	-	1.5	R. NORKOTAH	1.5	-	-
ND860-2	3.5	-	3.0	R. NUGGET	-	1.0	-
NDA2031-2	3.0	3.5	-	RANGER R.	4.0	-	-
NEWLEAF-RB	-	-	1.0	RED GOLD	4.5	-	-
NORCHIP	1.5	-	3.0	RED NORLAND	2.0	-	2.0
NY101	1.5	1.0	1.0	RED PONTIAC	5.0	2.5	4.0
NY102	2.0	3.0	-	REDDALE	-	-	2.0
NY103	-	3.5	3.0	ROMINA	-	-	4.0
NY111	-	-	3.0	ROSE GOLD	4.0	-	-
ONAWAY	1.0	1.5	1.5	SAGINAW GOLD	3.0	3.0	2.5
P84-13-12	1.0	1.5	3.0	SANTE	3.5	3.0	-
P88-13-4	-	2.0	-	SHEPODY	-	4.5	4.0
P88-15-1	2.5	3.5	-	SNOWDEN	2.0	3.5	3.0
P88-9-8	3.0	3.0	-	ST. JOHNS	3.0	3.0	4.0

Michigan Table 7 (Continued).

Line	1994 Rating ¹	1995 Rating	1996 Rating	Line	1994 Rating	1995 Rating	1996 Rating
PEMBINA CHIPPER	1.0	1.5	-	SUPERIOR	1.0	1.5	-
PENTA	3.0	4.5	-	SW88-112	-	-	3.5
PICASSO	-	-	1.5	SW88-113	-	3.0	2.0
PIKE	-	1.0	1.5	W1149	3.0	3.5	-
PORTAGE	3.5	2.5	-	W1151	-	-	1.5
PREMIER	-	-	3.5	W1242	-	3.0	3.0
PRESTILE	1.0	1.0	-	W1313	-	-	2.5
R. BURBANK	2.0	2.0	1.0	YUKON GOLD	-	3.5	2.0

¹Scab rating: 1 = practically no infection, 2 = low infection, 3 = avg. susc. (i.e. Atlantic), 4 = susc. (high), 5 = severe susc.

Michigan Table 8. 1996 Blackspot bruise susceptibility samples.

A. Simulated Bruise Samples*

Variety	Number of Spot per Tuber						Total Tubers	% Bruise Free	Ave Spots/tuber
	0	1	2	3	4	5+			
<u>Date of Harvest: Long-late</u>									
C0083008-1	27	1					28	96	0.036
CENTURY R	25	1					26	96	0.038
C081082-1	23	2					25	92	0.080
NEWLEAF	24	3					27	89	0.111
GOLDRUSH	23	5					28	82	0.179
C082142-4	20	6					26	77	0.231
A7961-1	21	4	1				26	81	0.231
A84118-3	18	5	1				24	75	0.292
R. BURBANK	15	9	1				25	60	0.440
JS111-28	18	3	4	1			26	69	0.538
SHEPODY	13	12	2				27	48	0.593
A082611-7	17	2	5	1			25	68	0.600
MSB106-8	16	6	2	1	1		26	62	0.654

Date of Harvest: Round Whites-late

NY101	24	1					25	96	0.040
PIKE	22	3	1				26	85	0.192
ST. JOHNS	19	6					25	76	0.240
ONAWAY	18	6					24	75	0.250
AF1426-1	19	4	1				24	79	0.250
AF1470-17	18	4	1	1			24	75	0.375
MSA091-1	19	5	1		1		26	73	0.423
FL1887	17	7	2				26	65	0.423
FL1867	13	7	3	1			24	54	0.667
NY111	15	4	5		1		25	60	0.720
NORVALLEY	11	9	3	1			24	46	0.750
MAINESTAY	11	5	6	1	2		25	44	1.120
SNOWDEN	9	3	11	2			25	36	1.240
FL1833	13	2	4	2	1	2	24	54	1.250
MSB083-1	7	8	6	4			25	28	1.280
MSB107-1	5	6	7	2	2		22	23	1.545
ATLANTIC	7	5	4	3	2	1	22	32	1.591
MSB076-2	6	8	3	6	4		27	22	1.778
NY103	6	6	6	4		3	25	24	1.800
FL1863	2	3	3	5	5	7	25	8	3.160

Variety	Number of Spot per Tuber						Total Tubers	% Bruise Free	Ave Spots/tuber
	0	1	2	3	4	5+			
<u>North Central Regional Trial</u>									
NORLAND	25						25	100	0.000
R. NORKOTAH	24	1					25	96	0.040
MSB007-1	24	1					25	96	0.040
ND2676-10	23	2					25	92	0.080
NORCHIP	23	2					25	92	0.080
MN16489	23	2					25	92	0.080
W1151RUS	23	2					25	92	0.080
R. PONTIAC	22	3					25	88	0.120
W1242	21	4					25	84	0.160
MN16180	20	5					25	80	0.200
ND2225-1R	19	6					25	76	0.240
R. BURBANK	19	5	1				25	76	0.280
SNOWDEN	16	6	3				25	64	0.480
MSB106-7	17	4	2	2			25	68	0.560
MSB076-2	21		1		1	2	25	84	0.640
ATLANTIC	15	5	3	2			25	60	0.680
W1313	13	4	3	3	2		25	52	1.080
<u>European Trial</u>									
MSD029-3Y	25						25	100	0.000
SW88-112	25						25	100	0.000
PICASSO	25						25	100	0.000
ROMINA	25						25	100	0.000
MICHIGOLD	24	1					25	96	0.040
IS. SUNSHINE	24	1					25	96	0.040
DITTA	24	1					25	96	0.040
AMINCA	24		1				25	96	0.080
SW88-113	23	2					25	92	0.080
ERNTESTOLZ	23	2					25	92	0.080
FELSINA	23	1	1				25	92	0.120
LILI	23	1	1				25	92	0.120
MSA097-1Y	22	3					25	88	0.120
SAGINAW GOLD	22	2		1			25	88	0.200
LATONA	18	5					23	78	0.217
PREMIER	19	6					25	76	0.240
JULIANNA ROSE	15	9	1				25	60	0.440
MORNING GOLD	15	5	1	2			23	65	0.565
MATILDA	13	11			1		25	52	0.600

Variety	Number of Spot per Tuber						Total Tubers	% Bruise Free	Ave Spots/tuber
	0	1	2	3	4	5+			
MSU Breeding Lines 2 X 23 Trial									
F014-9	19	1					20	95	0.050
E228-1	19	1					20	95	0.050
F096-8	19	1					20	95	0.050
E217-F	17	1					18	94	0.056
F380-5	19	2					21	90	0.095
E192-8	16	3	1				20	80	0.250
E026-A?	15	4	1				20	75	0.300
F002-01	15	4	1				20	75	0.300
F085-3	8	1	1				10	80	0.300
F097-1	15	3	1	1			20	75	0.400
F020-23	13	6	1				20	65	0.400
F092-3	13	6	1				20	65	0.400
F194-3	15	1	2	1			19	79	0.421
F099-3	13	5	2				20	65	0.450
F001-02	13	4	4				21	62	0.571
F165-6RY	15	2	1		2		20	75	0.600
F059-1	13	3		3			19	68	0.632
F373-8	12	2	3		1	42			
B0952-1	21	4					25	84	0.160
E012-1	20	5					25	80	0.200
ND2676-10	20	5					25	80	0.200
E228-9	20	5					25	80	0.200
C121-7	19	6					25	76	0.240
AF1433-4	20	2					25	8	2.360
P84-13-12		4	5	10	6	1	26	0	2.808
C148-A			4	4	8	9	25	0	3.880
ND860-2	1			4	8	10	23	4	4.087
E247-2			2	1	5	17	25	0	4.480

** Tuber samples were collected at harvest, graded, and placed in a six-sided plywood drum and turned ten times to produce simulated bruising. Samples were abrasive-peeled and scored on October 28, 1996.

B. Check Bruise Samples**

Variety	Number of Spot per Tuber						Total Tubers	% Bruise Free	Ave Spots/tuber
	0	1	2	3	4	5+			
<u>Date of Harvest: Longs-late</u>									
NEWLEAF	25						25	100	0.000
SHEPODY	25						25	100	0.000
CENTURY R	25						25	100	0.000
A7961-1	25						25	100	0.000
C081082-1	24	1					25	96	0.040
C082142-4	23	2					25	92	0.080
R. BURBANK	23	2					25	92	0.080
MSB106-8	23	2					25	92	0.080
C0083008-1	24	2	1				27	89	0.148
GOLDRUSH	20	3	1	1			25	80	0.320
A84118-3	15	8	1	1			25	60	0.520
A082611-7	17	1	7				25	68	0.600
JS111-28	15	8	1	1	1		26	58	0.654

Date of Harvest: Round Whites-late

MSB107-1	25						25	100	0.000
ST. JOHNS	25						25	100	0.000
NY101	25						25	100	0.000
MSA091-1	24	1					25	96	0.040
MAINESTAY	24	1					25	96	0.040
AF1470-17	23	1	1				25	92	0.120
SNOWDEN	20	4	1				25	80	0.240
PIKE	21	3		1			25	84	0.240
FL1887	20	2	1	1			24	83	0.292
MSB076-2	20	4	1	1			26	77	0.346
MSB083-1	20	3	1			1	25	80	0.360
ATLANTIC	17	6	2				25	68	0.400
ONAWAY	20		1	1	0	1	23	87	0.435
NORVALLEY	17	5	3				25	68	0.440
NY111	17	6	1			1	25	68	0.520
FL1833	16	4	2	2			24	67	0.583
NY103	15	2	3	2	2		24	63	0.917
FL1867	19		5	1	3	3	31	61	1.290
FL1863	2	3	8	4	3	2	22	9	2.409

**Tuber samples were collected at harvest and graded, with no further bruising. Samples were abrasive - peeled and scored on October 29, 1996.

Variety	Number of Spot per Tuber						Total Tubers	% Bruise Free	Ave Spots/tuber
	0	1	2	3	4	5+			
<u>Adaptation Trial</u>									
E220-3	24						24	1.00	0.000
E263-3	23						23	1.00	0.000
E228-9	25						25	1.00	0.000
E226-4Y	25						25	1.00	0.000
ND2676-10	25						25	1.00	0.000
C103-2	24	1					25	0.96	0.040
E228-11	22	1					23	0.96	0.043
B094-1	23	2					25	0.92	0.080
E041-1	23	2					25	0.92	0.080
C125-8	23	1	1				25	0.92	0.120
B0952-1	22	3					25	0.88	0.120
B073-2	23	1	1				25	0.92	0.120
C121-7	22	4					26	0.85	0.154
E202-3	22	2	1				25	0.88	0.160
SNOWDEN	22	1	2				25	0.88	0.200
E230-6	22	2	1	1			26	0.85	0.269
MSB110-3	20	3	2				25	0.80	0.280
E273-8	15	7					22	0.68	0.318
E048-2Y	19	4	2				25	0.76	0.320
E221-1	21		3	1			25	0.84	0.360
E012-1	19	4	1	1			25	0.76	0.360
AF1433-4	19	4	2	1			26	0.73	0.423
B040-3	20		3	2			25	0.80	0.480
NT-1	20	1	2	1		1	25	0.80	0.520
B057-2	18	2	3		2		25	0.72	0.640
C120-1Y	13	8	2		1		24	0.54	0.667
E149-5Y	14	5	1	4	1		25	0.56	0.920
E247-2	8	8	6	1		2	25	0.32	1.320
ATLANTIC	4	8	5	3	2	3	25	0.16	2.000
E018-1	8	4	1	4	4	3	24	0.33	2.042
ND860-2	3	4	8	5	1	5	26	0.12	2.462
C148-A	3	5	5	2	1	7	23	0.13	2.609
P84-13-12		4	7	4	5	5	25	0.00	3.000

*** Tuber samples were collected at harvest and graded, with no further bruising. Samples were abrasive-peeled and scored on October 29, 1996.

Nebraska Potato Variety Trials

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Introduction

In 1996, trials were conducted at Imperial and Kearney on both chipstock and tablestock entries. All entries were not planted at both locations due to availability. There were three red, 11 russet, two long-white and seven round-white-skinned entries in the trials. Nebraska also participated in the North Central Regional (NCR) trial that was conducted at the Panhandle Research and Extension Center (PREC) in Scottsbluff. In this trial, there were 17 entries.

Materials, Methods and Conditions

Soils ranged from a sandy loam to a silty loam; pHs were from 5.6 to 7.9, and organic matter content was from less than 1% to 2.5%. The ranges of major fertilizers were 180 to 330 lb N/ac, 90 to 180 lb P/ac, 0 to 350 lb K/ac and 0 to 80 lb S/ac. At some locations, boron, magnesium and/or zinc were also added. Seed pieces were cut, treated with TOPS2.5D and stored for seven to 30 days at 55 F. Growers used their conventional practices. Insecticides were Thimet applied at planting and, depending on location, post-emergence applications of Asana for Colorado potato beetles, Monitor for green peach aphids and DiPel for European corn borers. Depending on location, Turbo or Prowl plus Lexone were applied pre-emergence or at hilling and Poast (Ultima) was applied post-emergence for grasses. Besides the seed treatment, Bravo, Dithane and Tattoo C were used for early and late blight prevention. Vines were desiccated with Diquat or let die naturally.

The trial design was 60-100 foot strip plots from which a 24-foot section was harvested. The North Central Regional Trial was conducted as four replicate plots of 25 seedpieces. The key growth dates for all trials are listed in Table 1. Trials were conducted under overhead sprinkler irrigation. Rainfall and relative humidity tended to be above normal. Temperature was normal to slightly cool. Hail occurred at one location. Some late blight appeared toward the end of the season.

Yield data were taken on tubers under 1-7/8 in, between 1-7/8 and 4 in, and over 4 in sizes. Within a week after harvest, tuber defects and specific gravities on 1-7/8 to

4-inch tubers were determined visually and using a hydrometer, respectively. Chip color of round, white-skinned and red-skinned entries, and fry color of long, white-skinned and russet-skinned entries were measured using an Agtron E-10. Color was determined a month after harvest, after curing at 60 F.

Table 1. Key dates for each trial in 1996.

	IM	KE	SB
P	4/18	4/27	5/8
D	died	9/22	9/13
H	8/23	10/15	9/22
days:			
P to D	96	148	128

IM=Imperial, KE=Kearney, SB=Scottsbluff
P=planting, D=desiccation, H=harvest

Results and Discussion

YIELDS: Red LaSoda has consistently been a high yielding variety in both summer and fall crops. High yielders in the summer crop from Imperial (>300 cwt US#1/acre) were, among russets, Hi-Lite, Russet Burbank and A81-473-2, among whites, Coastal Chip. In the fall crop from Kearney, high yielders (>400 cwt US#1/acre) were, among russets, Russet Burbank, A81-386-1, A86-102-6, and AO82-611-7; among white varieties, they were Itasca, Shepody, Atlantic, Coastal Chip, and Snowden.

SPECIFIC GRAVITY: Among russets, the highest specific gravities (>1.075) were obtained from A81-473-2 and A84-95-1 in the summer crop, and, in the fall crop, they were obtained from Ranger Russet, A81-386-1, A84-95-1, and AO82-611-7. Among white entries, the highest specific gravities (>1.080) were obtained from Atlantic, MaineChip and Pike in the summer crop, and, in the fall crop, specific gravities above 1.085 were obtained from Atlantic, MaineChip and Suncrisp.

COOKING COLOR: The lightest french fries without blanching measured out of the field in both locations were A84-95-1 and COO83-008-1. Ranger Russet and Russet Norkotah fried light from Imperial and Krantz fried light from Kearney. A81-386-1, A81-473-2, Itasca and Shepody also produced good fries.

The lightest potato chips out of the field by far were measured with Andover at both locations. In Imperial, all chip entries produced a light chip; at Kearney, average chip color was darker than desired possibly due to the mid-October harvest.

TUBER DEFECTS:

Summer Crop -- Common scab was observed, all on the surface (no pits); the number of infected tubers and the surface covered varied among entries. Most susceptible (>10% tubers and >5% covered) were Ranger Russet, A86-102-6, COO83-008-1, Atlantic, Coastal Chip, and Snowden. Two other defects, hollow heart and off-shape (knobs, bends, growth cracks, pointy ends, etc.), were common. The most hollow heart (>5% tubers) occurred with A86-102-6 and Pike. Off-shape (>10% tubers) occurred with Red LaSoda, A81-473-2, A86-102-6, COO83-008-1, Shepody, and Suncrisp. No black scurf, vascular discoloration or rots, etc. were observed at this location.

Fall Crop -- Common scab was present only in Atlantic (5% of US#1 tubers). Tuber off-shape played a major factor and was most prevalent (>15% of US#1 tubers) in Red LaSoda, Russet Burbank, A81-473-2, A86-102-6, AO82-611-7, COO83-008-1, Coastal Chip, and Suncrisp. Tubers were elongated and thin from Ranger Russet and Russet Burbank, and slightly elongated from A81-386-1 and COO83-008-1. Black scurf (>10%) was observed with Ranger Russet, Russet Burbank, A81-473-2, Itasca, Shepody, Coastal Chip, and MaineChip. Hollow heart appeared in over 10% of US#1 tubers with A84-95-1, A86-102-6, Atlantic, MaineChip, Snowden, and Suncrisp. Vascular discoloration was observed in Hi-Lite Russet; tuber rot at the stem end (blackleg suspected) in Russet Burbank, and sunburn in Suncrisp.

Nebraska Table 2. Imperial -- yield and tuber quality of potato entries, 1996.

Entries	Total Yield cwt/ac	US#1 Yield cwt/ac	Specific Gravity	Chip Color	Common Scab % tubers	% Defects and Type ²
Red LaSoda #	342	333	1.060	39	5 l ¹	12 OS
Hi-Lite Rus. *	354	326	1.065	39	7 l	0
Ranger Russet *	306	278	1.070	55	16 m	4 OS
Rus. Burbank *	335	302	1.065	40	0	6 OS
Rus. Norkotah *	247	235	1.065	52	0	3 HH
A81-386-1 *	209	163	1.065	46	0	20 S
A81-473-2 *	318	302	1.080	48	6 l	14 OS
A84-95-1 *	336	224	1.075	56	11 l	7 OS
A86-102-6 *	163	151	1.072	35	18 m	21 OS, 6 HH
AO82-611-7 *	327	290	1.072	43	0	1 HH
COO83-008-1 *	316	218	1.074	54	12 m	15 OS
---	---	---	----	--		
russet means:	291	249	1.070	47	--	--
Shepody @	181	169	1.065	48	0	10 OS
Andover +	308	296	1.070	70	0	2 HH
Atlantic +	306	290	1.080	64	18 m	1 HH
Coastal Chip +	342	311	1.072	66	19 m	9 OS
MaineChip +	314	284	1.085	59	11 l	30 S, 4 HH
Pike +	342	293	1.084	57	7 l	9 HH
Snowden +	163	151	1.070	63	15 m	40 S, 3 HH
Sun crisp +	290	278	1.075	65	16 l	13 OS
---	---	---	----	--		
chipper means:	295	272	1.077	63	--	--

¹ surface scab: l=light, <5% tuber surface; m=medium, 5-25% tuber surface.

² Defect Types: HH = hollow heart, OS = off-shape.

= red-skinned entry; * = russet-skinned entry; @ = long, white-skinned entry; + = round, white-skinned entry.

Nebraska Table 3. Kearney -- yield and tuber quality of potato entries, 1996.

Entries	Yield US#1 cwt/ac	US#1 as % total	Specific Gravity	Chip Color	Off- Shape % tubers	% Defects and Type ¹
Red LaSoda #	602	587	1.064	28	40	5 HH
Dk Rd Norland #	445	424	1.059	30	4	0
Red Ruby #	417	393	1.062	27	8	0
---	---	---	----	--		
red means:	488	468	1.062	28	--	--
Hi-Lite Rus. *	424	357	1.065	42	4	6 BS, 5 VD
Krantz *	278	272	1.067	48	4	4 HH
Ranger Russet *	290	278	1.084	33	12	28 BS ²
Rus. Burbank *	517	466	1.071	44	40	10 BS, 15 RT ²
A81-386-1 *	608	581	1.077	41	5	0 ²
A81-473-2 *	407	393	1.070	43	15	20 BS, 5 HH
A84-95-1 *	408	381	1.079	54	5	15 HH
A86-102-6 *	599	587	1.073	25	15	15 HH
AO82-611-7 *	575	514	1.078	34	50	0
COO83-008-1 *	245	230	1.060	47	25	0 ²
---	---	---	----	--		
russet means:	435	406	1.072	41	--	--
Itasca @	466	424	1.065	51	15	35 BS
Shepody @	492	490	1.073	44	10	20 BS, 5 HH
Andover +	327	315	1.079	67	5	5 HH
Atlantic +	463	442	1.086	50	10	5 CS, 7 BS, 15 HH
Coastal Chip +	538	520	1.074	51	40	20 BS, 5 HH
MaineChip +	380	357	1.086	51	6	16 BS, 50 HH
Pike +	414	387	1.083	57	8	0
Snowden +	454	436	1.081	53	10	20 HH
Suncrisp +	405	399	1.085	50	40	15 HH, 4 SB
---	---	---	----	--		
chipper means:	426	408	1.082	54	--	--

¹ Defect Types: BS = black scurf (*Rhizoctonia solani*), CS = common scab (*Streptomyces scabies*), HH = hollow heart, RT = wet rot at stem end (blackleg), SB = sun burned, VD = vascular discoloration.

² Comments: Ranger Russet and Russet Burbank = elongated, thin tubers;

A81-386-1 = elongated, COO83-008-1 = slightly elongated.

= red-skinned entry; * = russet-skinned entry; @ = long, white-skinned entry; + = round, white-skinned entry.

NEW JERSEY

Melvin R. Henninger

Introduction

Trials were conducted at the Rutgers Research & Development Center in Upper Deerfield Township and The Snyder Research & Extension Farm near Pittstown. All plots were 21' long and 3' wide. Seedpieces were spaced at 9" for round types and 12" for long types. At the Upper Deerfield site, 200 lbs./A of 0-0-60 and 500 lbs./A of 10-10-10 was broadcast and disk-in before planting on 4/19. Dual and sencor were applied 4 days after planting. Additional 100 lbs./A nitrogen was topdressed 5 weeks after planting. At the Snyder Farm 750 lbs./A of 15-15-15 was broadcast and disk-in before planting on 5/15. Dual and sencor were applied immediately after planting.

The Upper Deerfield plots were harvested with a single-row mount commercial harvester modified for bagging. No attempt was made to recover any lost tubers caused by normal harvester operation. All plots were sized with a spool sizer and specific gravities were determined by the weight in air and water method. Chip color was done by Mr. Steve Molnar of Wise Foods four days after harvest.

The Snyder Farm plots were harvested on 9/26 with a single-row commercial potato digger. Round types were sized with a spool sizer, the long types were sized by weight, and specific gravities were determined by the weight in air and water method.

In 1996, planting was late and growing conditions were excellent all season. Rainfall was supplemented by irrigations. Growth through-out the season was good. Heat sprouts, second growth, and internal heat necrosis were the main problems, but not as severe as in the past.

Insects and diseases were not a problem and did not limit growth.

To simplify above information, trade names of some products are used. No endorsement is intended, nor is criticism implied of similar products not named.

NJ Variety Table 1.

Yields, Specific Gravities, and Tuber Sizes for 24 Round White Potato Varieties, Harvested **Main Season** and Grown on a Sandy Loam Soil at the Rutgers Agricultural Res. & Ext. Center - Upper Deerfield, NJ - 1996 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)					
			cwt/a	Sup.		1	7/8	2 1/2		1	2	3	4	5	
NorValley	ne	434	399	123	1.075	93	50		1	7	43	41	9	0	
B0257-12	ne	423	396	122	1.081	96	60		3	4	36	48	13	0	
B0564-9	ne	399	373	115	1.076	94	52		1	6	42	45	8	0	
Salem-NY84	ct	420	369	114	1.063	92	36		4	8	56	30	6	0	
Quaggy Joe	ne	425	368	113	1.061	91	44		4	9	47	38	6	0	
ND2471- 8	ne	396	363	112	1.085	93	52		2	7	41	45	7	0	
Atlantic	ne	388	363	112	1.088	95	65		2	5	30	42	22	1	
W 870	ne	387	362	112	1.090	95	52		2	5	44	44	8	0	
AF 875-15	ne	383	357	110	1.081	96	56		3	4	41	48	8	0	
NY87	ne	368	336	104	1.073	93	40		2	7	52	31	10	0	
White Flow	ct	361	332	102	1.087	94	56		2	6	38	37	18	1	
Kathahdin	ne	363	331	102	1.068	92	44		1	8	48	36	8	1	
Superior	ne	343	324	100	1.073	97	59		2	3	38	55	5	0	
AF1424- 7	ne	339	310	96	1.080	94	53		3	6	42	49	4	0	
Conestoga	ne	334	304	94	1.074	95	62		4	5	33	47	16	0	
Snowden	ne	322	294	91	1.084	93	53		2	7	40	43	11	0	
B0178-34	ne	351	294	91	1.092	95	57		12	5	38	47	9	0	
Niska	ne	361	293	91	1.076	91	20		11	9	71	20	1	0	
AF1565-12	ne	330	293	90	1.067	91	36		2	9	54	33	3	0	
AF1424- 6	ne	301	288	89	1.081	97	76		1	3	21	54	21	0	
AF1426- 1	ne	345	280	86	1.073	97	62		16	3	34	53	9	0	
AF1425- 1	ne	323	276	85	1.072	89	34		4	11	54	32	2	0	
B0564-8	ne	311	272	84	1.072	89	41		1	11	48	32	9	0	
AF1480- 5	ne	368	250	77	1.076	90	30		25	10	61	28	1	0	
Grand Mean		365	326		1.077	93	50		5	7	44	41	9	0	
CV (4)		9	10		.21	2	13								
W-D Bayes LSD.05		44	44		.003	2	8		3	2	8	8	6	ns	

- (1) Plots were 21' long and 3' wide with 4 reps. Commercial cultural practices were used which included irrigation. Seedpieces were spaced at 9", planted on 4/19, and harvested on 8/6.
- (2) ct = Certified Seed, ne = Northeast Regional Project.
- (3) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 1/2, S3= 2 1/2 to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.
- (4) CV=Coef of Variation; W-D Bayes LSD.05=Waller Duncan Test For Least Significant Difference.

NJ Variety Table 2. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings Grown in Upper Deerfield, NJ 1996 (1).

Variety	PLANT			TUBER CHARACTERS								TUBER DEFECTS								OVER		Comments	
	A	P	P	M	S	S	C	T	S	D	A	S	G	C	S	H	H	N	R	CC	ALL		
NorValley	7	6		5	7	7	8	8	8	2	8	7	7	7	9	9	0	0	0		35	yes	nice chips
B0257-12	7	5		5	7	7	7	6	6	4	7	7	7	7	9	7	0	0	0		36	ok	gone
B0564- 9	7	4		3	7	7	7	6	6	1	8	8	8	9	9	9	0	0	0		56	yes	nice, good yield
Salem-NY84	7	6		7	2	7	8	8	8	2	7	7	7	7	8	8	0	0	0		66	yes	some rot
Quaggy Joe	5	5		6	3	6	8	8	8	3	3	6	6	8	9	9	2	5	8		58	no	some rot
ND2471- 8	7	6		5	6	6	8	8	8	2	7	7	7	9	9	9	2	0	0		44	yes	replace Atlantic
Atlantic	7	6		6	4	4	7	6	6	2	8	8	8	9	9	9	1	11	7		56	std	Heat Nec.
W 870	7	6		5	5	5	8	8	8	2	3	6	6	9	9	9	0	0	0		67	yes	flat tubers
AF 875-15	6	4		4	6	6	8	6	6	2	7	7	7	9	9	9	0	0	0		35	yes	nice chips
NY 87	7	6		5	6	6	8	7	7	2	7	7	7	8	9	9	0	0	0		45	yes	nice appearance
White Flower	7	6		5	5	5	6	6	6	2	8	7	7	8	9	9	4	3	7		57	ck	hollow heart
Kathahdin	8	6		7	2	2	8	8	8	2	6	7	7	7	9	9	0	0	0		77	std	
Superior	7	6		3	8	7	7	6	6	2	7	7	7	8	9	9	0	0	0		67	std	
AF1424- 7	4	5		4	5	5	8	8	8	2	5	6	6	9	9	9	0	0	0		35	ok-	some scab
Conestoga	7	5		3	7	7	7	7	7	2	8	7	7	8	8	9	0	0	0		56	yes	ok
Snowden	8	7		7	5	7	7	6	6	2	8	8	8	9	9	9	0	0	0		35	yes	nice chips
B0178-34	8	6		5	7	7	7	6	6	3	5	7	7	8	9	9	0	0	0		45	yes	some scab
Niska	7	6		6	5	5	8	8	8	6	6	4	4	8	4	9	0	0	0		55	no	bad growth cr.
AF1565-12	3	5		5	7	7	8	8	8	2	6	5	5	9	6	9	0	0	0		36	no	poor appearance
AF1424- 6	6	5		4	3	3	8	7	7	4	6	7	7	9	9	9	0	0	0		45	no	variable shape
AF1426- 1	6	6		4	6	6	7	7	7	5	5	4	4	5	5	9	0	0	0		35	no	growth cracks
AF1425- 1	6	6		4	7	7	8	7	7	4	6	5	5	8	7	9	0	1	8		35	no	poor appearance
B0564- 8	6	6		4	8	8	6	5	5	2	8	7	7	7	8	8	0	0	0		35	ok	poor yield
AF1480- 5	7	5		7	6	6	7	7	7	4	5	5	5	3	9	9	0	2	8		47	no	small tubers

(1) See NJ Rating Table for plant and tuber characters, tubers defects and chip color ratings.
 (2) HH = No. of Hollow Heart tubers out of 40. HN = No. of Heat Necrosis tubers out of 40.

NJ Variety Table 3.

Yields, Specific Gravities, and Tuber Sizes for 19 Round White Potato Varieties, Harvested **Main Season** and Grown on a Sandy Loam Soil at the Rutgers Agricultural Res. & Ext. Center - Upper Deerfield, NJ - 1996 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield % of Sup.		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)		
			cwt/a	cwt/a		1	7/8	2 1/2		1	2	3
B0856-4	cf	428	401	113	1.066	96		64	3	4	32	42
AF1612-20	me	411	389	110	1.075	97		65	2	3	32	43
Atlantic	ne	400	376	106	1.088	96		67	1	4	29	43
NY 111	ny	404	370	105	1.085	92		48	1	8	45	41
NY 109	ny	383	361	102	1.066	97		62	3	3	34	52
NY 107	ny	386	356	101	1.078	94		58	2	6	36	48
B1088-37	cf	388	356	100	1.068	97		81	5	3	16	42
Superior	ne	382	354	100	1.072	96		60	4	4	36	55
NY 1235-5	ny	414	332	94	1.073	93		40	15	7	54	36
B0178-34	cf	372	330	93	1.090	95		63	7	5	33	49
B1110-11	cf	358	322	91	1.079	95		59	5	5	36	50
B1071-20	cf	402	322	91	1.071	93		37	14	7	55	36
B1081-4	cf	399	316	89	1.088	95		50	17	5	46	48
NY 108	ny	316	299	84	1.075	96		76	1	4	20	40
Cobbler	cf	348	298	84	1.077	92		46	7	8	45	41
B1093-46	cf	322	297	84	1.069	94		72	2	6	21	53
Andover	ct	300	266	75	1.079	93		42	5	7	51	36
AF1714-2	me	283	261	74	1.077	95		58	2	5	37	43
AF1668-60	me	258	239	68	1.075	94		44	1	6	50	39
Grand Mean		365	328		1.076	95		57	5	5	38	44
CV (4)		11	13		.23	2		11				
W-D Bayes LSD.05		58	61		.003	2		8	5	2	8	8
												9
												ns

- (1) Plots were 21' long and 3' wide with 4 reps. Commercial cultural practices were used which included irrigation. Seedpieces were spaced at 9", planted on 4/19, and harvested on 8/6.
 (2) ct= Cert., cf= USDA Chapman Farm, me= Univ. of Maine, ne= NE Regional Project, ny= Cornell.
 (3) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 1/2, S3= 2 1/2 to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.
 (4) CV=Coef of Variation; W-D Bayes LSD.05=Waller Duncan Test For Least Significant Difference.

NJ Variety Table 4. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings Grown in Upper Deerfield, NJ 1996 (1).

Variety	PLANT				TUBER CHARACTERS							TUBER DEFECTS							OVER		Comments			
	A		P		M	S	S	C	T	S	D	A	S		G	C	S	H	H	N		R	CC	ALL
	p	p	t	s	s	l	x	h	p	p	p	p	G	G	H	H	N	R	CC	ALL				
B0856-4	7	5	4	6	8	9	9	2	8	8	8	8	9	8	9	9	0	0			34	yes	early chipper	
AF1612-20	7	5	4	5	8	8	8	3	8	7				8	6	0	4	8			66	yes	heat sprouts	
Atlantic	7	6	6	5	6	5	6	2	8	8	8	8	9	9	9	4	14	7			47	std		
NY 111	8	6	4	5	6	6	6	2	6	7				9	9	0	3	7			36	yes	nice chips	
NY 109	6	4	3	6	8	8	8	3	7	8				9	9	0	2	8			46	ok+	some air cracks	
NY 107	7	7	7	6	7	7	7	2	8	7				9	9	0	9	8			36	yes	hn nice chips	
B1088-37	7	5	6	7	6	7	6	3	8	8	8	8	9	8	9	0	0				57	yes	good size	
Superior	7	5	3	8	6	6	6	3	7	8	8	8	9	9	9	0	4	7			57	std		
NY L235-5	8	7	6	2	6	7	6	2	6	6	6	6	7	7	5	9	0	0				no	gone	
B0178-34	7	7	7	5	8	7	7	2	6	6	6	6	8	8	9	0	0				46	yes	scab	
B1110-11	6	7	7	6	6	6	6	3	7	6	6	6	9	6	9	3	3	7			45	ok	growth cracks	
B1071-20	7	7	5	8	6	5	6	3	4	5	5	7	9	4	9	0	1	7				no	2nd. growth	
B1081-4	7	4	4	5	7	6	6	3	7	7	7	7	5	9	7	0	3	6				no	2nd. growth	
NY 108	7	6	7	7	6	5	6	2	8	8	8	8	9	9	9	0	0				46	yes	low yield	
Cobbler	7	4	4	5	7	7	7	2	8	6	6	6	8	8	9	1	1	8				std		
B1093-46	7	7	8	3	8	8	8	2	8	7				8	9	0	20	7				no	bad heat nec.	
Andover	6	3	4	6	6	6	6	2	8	7				8	8	0	1	8			34	ok	some early blight	
AF1714-2	5	2	3	6	8	8	8	2	5	6	6	6	9	8	9	0	0				36	no	early blight	
AF1668-60	3	5	3	7	6	6	6	3	7	6	6	6	9	9	9	0	1	7				no	poor yield	

(1) See NJ Rating Table for plant and tuber characters, tubers defects and chip color ratings.

(2) HH = No. of Hollow Heart tubers out of 40. HN = No. of Heat Necrosis tubers out of 40.

NJ Variety Table 5.

Yields, Specific Gravities, and Tuber Sizes for 18 Round White Potato Varieties, Harvested **Late** and Grown on a Sandy Loam Soil at the Rutgers Agricultural Res. & Ext. Center - Upper Deerfield, NJ - 1996 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)				
			cwt/a	% of Sup.		1	7/8	2 1/2		1	2	3	4	5
B1240- 1	cf	527	488	123	1.089	98	82	82	5	2	16	38	44	0
Salem-NY84	ct	516	462	116	1.069	96	62	62	7	4	34	44	18	0
Atlantic	ne	496	457	115	1.087	97	71	71	5	3	26	40	29	2
St. Johns	ne	492	440	111	1.074	96	67	67	7	4	29	52	15	0
NorValley	ne	483	439	110	1.078	94	49	49	3	6	45	39	10	0
B0257-12	ne	468	432	109	1.084	97	68	68	5	3	29	52	16	0
B0564- 8	cf	463	429	108	1.077	95	53	53	2	5	42	44	9	0
B0564- 9	cf	457	426	107	1.076	97	70	70	4	3	27	47	23	0
ND2417-8	ne	464	424	107	1.088	96	64	64	4	4	32	54	10	0
B0178-34	cf	471	417	105	1.097	97	71	71	9	3	26	46	25	0
Snowden	ne	430	411	103	1.088	98	66	66	2	2	32	45	21	0
AF 875-15	me	441	408	103	1.089	96	59	59	4	4	38	47	12	0
NY 87	ne	431	403	101	1.079	95	43	43	2	5	52	34	9	0
Superior	ne	427	398	100	1.072	98	65	65	5	2	32	54	11	0
Conestoga	ne	411	392	98	1.075	97	69	69	2	3	28	43	25	0
Wh Flower	ct	356	306	77	1.090	97	67	67	12	3	30	41	25	1
B0766- 3	cf	267	253	64	1.077	98	72	72	3	2	26	47	25	0
Andover	ct	270	246	62	1.081	94	46	46	3	6	48	35	11	0
Grand Mean		437	402		1.082	96	64	64	5	4	33	44	19	0
CV (4)		10	11		.22	1	8	8						
W-D Bayes LSD.05		60	58		.003	2	7	7	4	2	6	8	6	ns

- (1) Plots were 21' long and 3' wide with 4 reps. Commercial cultural practices were used which included irrigation. Seedpieces were spaced at 9", planted on 4/19, and harvested on 9/4.
 (2) ct = Cert. Seed, cf = USDA Chapman Farm, me = Univ. of Maine, ne = NE Regional Project.
 (3) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 1/2, S3= 2 1/2 to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.
 (4) CV=Coef of Variation; W-D Bayes LSD.05=Waller Duncan Test For Least Significant Difference.

NJ Variety Table 6. Plant and Tuber Characters, Tuber Defects and Overall Rating for Varieties and Seedlings Grown in Upper Deerfield, NJ 1996 (1).

Variety	PLANT				TUBER CHARACTERS								TUBER DEFECTS								OVER		Comments	
	A	P	P	M	S	S	C	T	x	h	p	p	A	S	G	C	S	H	H	N	R	ALL		
B1240- 1	7	8	9	3	7	7	3	7	6	6	6	8	9	8	9	9	0	0	0	0	0	0	yes	hol heart, scab
Salem-NY84	7	5	8	6	8	8	3	6	6	8	7	9	9	0	0	0	0	0	0	0	0	0	yes	ck
Atlantic	7	6	6	6	6	5	2	8	8	2	8	8	9	7	9	9	2	20	5	5	5	5	ck	heat necrosis
St. Johns	7	8	7	3	8	7	2	5	5	8	9	9	9	0	0	0	0	0	0	0	0	0	ok+	poor skin set
NorValley	8	5	5	8	8	9	2	6	6	8	8	9	9	0	0	0	0	0	0	0	0	0	yes	gone
B0257-12	7	7	6	7	7	7	3	6	7	9	7	9	9	2	5	6	6	6	6	6	6	6	no	gone
B0564- 8	6	6	5	9	6	6	2	8	8	2	8	8	9	8	9	9	0	1	6	6	6	6	ok+	small tubers
B0564- 9	6	5	4	9	6	7	2	7	8	2	7	8	9	9	9	9	2	0	0	0	0	0	yes	nice appearance
ND2471- 8	7	7	6	8	8	8	2	7	6	2	7	6	8	8	7	9	3	0	0	0	0	0	yes	some scab
B0178-34	8	7	6	6	8	8	3	6	6	7	8	8	7	8	8	1	1	7	7	7	7	7	yes	scab
Snowden	8	7	7	9	6	5	2	8	8	2	8	8	8	9	9	3	1	6	6	6	6	6	yes	ok size
AF 875-15	7	4	4	7	7	7	2	5	6	2	5	6	8	9	9	2	0	0	0	0	0	0	yes	yes
NY 87	8	6	5	9	8	7	3	6	7	8	8	9	8	8	9	0	0	0	0	0	0	0	yes	yes
Superior	7	6	3	9	6	5	3	6	7	8	9	9	8	9	9	0	0	0	0	0	0	0	std	std
Conestoga	7	4	3	7	7	7	2	6	7	9	9	9	9	9	9	0	0	0	0	0	0	0	ok+	?? yield
White Flower	7	7	6	8	5	5	2	8	6	6	7	9	6	7	9	3	15	5	5	5	5	5	no	heat necrosis
B0766- 3	6	3	3	7	7	6	4	6	6	9	7	6	9	7	6	0	0	0	0	0	0	0	ok	some heat sprouts
Andover	6	4	3	9	7	6	2	7	7	9	9	9	9	9	9	0	0	0	0	0	0	0	no	low yield

(1) See NJ Rating Table for plant and tuber characters, tuber defects and chip color ratings.

(2) HH = No. of Hollow Heart tubers out of 40. HN = No. of Heat Necrosis tubers out of 40.

NJ Variety Table 7.

Yields, Specific Gravities, and Tuber Sizes for 14 Russet Potatoes Varieties, Harvested **late** and Grown on a Silt Loam Soil at the Synder Agricultural Research & Ext. Farm near Pittstown, NJ - 1996 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r		% Culls	% Tuber Sizes (3)				
			cwt/a	% of Sup.		4 oz	8 oz		1	2	3	4	5
Century	ne	630	512	162	1.083	92	63	11	8	29	34	18	11
Coastal	cf	420	381	121	1.077	94	60	3	6	33	46	11	4
Krantz	ct	415	350	111	1.078	92	69	9	8	23	30	22	18
B9922-11	cf	406	348	110	1.085	93	62	8	7	30	34	19	10
B1004- 8	cf	418	342	108	1.086	86	40	5	14	46	33	6	1
Superior	ne	392	316	100	1.074	86	32	7	14	53	24	4	4
B0915- 3	cf	415	301	95	1.081	96	82	24	4	13	29	26	27
W1099 Rus	me	364	291	92	1.074	87	52	10	13	35	31	17	4
Norkotah	cf	299	261	82	1.069	90	58	3	10	33	35	15	7
BelRus	ne	283	236	75	1.081	86	42	4	14	44	28	10	4
AF1481- 4	ne	297	236	75	1.075	90	70	11	10	20	40	21	9
AF1701- 3	ne	451	236	75	1.077	94	71	44	6	24	35	24	12
Ranger	ne	313	234	74	1.086	87	50	14	13	37	32	12	5
AF1698- 4	ct	197	47	15	1.056	39	19	42	61	20	17	2	0
Grand Mean		378	292		1.077	86	55	14	14	31	32	15	8
CV (4)		14	18		.60	6	17						
W-D Bayes LSD.05		71	67		.009	7	12	6	7	10	13	7	8

- (1) Plots were 21' long and 3' wide with 4 reps. Commercial cultural practices were used which included irrigation. Seedpieces were spaced at 12", planted on 5/15, and harvested on 9/26.
 (2) ct = Cert. Seed, cf = USDA Chapman Farm, me = Univ. of Maine, ne = NE Regional Project.
 (3) Size 1 = Under 4 oz, S2 = 4 to 8 oz, S3 = 8 to 12 oz, S4 = 12 to 16 oz, and S5 = Over 16 oz.
 (4) CV=Coef of Variation; W-D Bayes LSD.05=Waller Duncan Test For Least Significant Difference.

NJ Variety Table 8. Plant and Tuber Characters, Tuber Defects, and Overall Rating for Varieties and Seedlings Grown near Pittstown, NJ - 1996 (1).

Variety	PLANT			TUBER CHARACTERS							TUBER DEFECTS							OVER		Comments			
	A	A	p	M	S	S	C	T	S	D	A	S	G	H	S	G	H	H	N		R	ALL	
	p	p	p	t	s	s	l	x	h	p	p	G	C	S	H	C	S	H	N		R	ALL	
Century	8	8		7	9	9	6	5	8	6	7	6	7	9	9	6	7	9	6	0		yes	2nd. growth hh
Coastal	6	7		6	9	9	6	5	8	7	7	9	7	9	9	4	7	9	11	6		no	heat necrosis
Krantz	7	6		6	9	9	8	7	5	6	6	9	7	9	9	0	7	9	0		ok+	no russetting	
B9922-11	8	6		8	9	9	5	3	7	5	6	9	6	9	9	21	9	9	0		yes	hh gc app-	
B1004- 8	8	7		5	9	9	5	4	6	6	7	9	6	9	9	13	9	9	2	7		yes	hol heart gc
Superior	7	5		4	9	9	7	6	5	6	7	8	9	9	9	0	9	9	0		std		
B0915- 3	8	7		7	9	9	5	2	8	7	6	7	6	9	9	23	7	4	9	6		no	hol heart & hn
W1099 Rus	7	6		6	9	9	5	3	9	6	6	7	6	9	9	12	7	6	9	0		yes	hol heart
Norkotah	6	7		4	9	9	5	3	8	6	7	9	6	9	9	7	9	9	0		ok		
BelRus	5	6		7	9	9	5	2	8	7	7	9	7	9	9	8	9	9	0		no	poor yield	
AF1481- 4	6	4		5	9	9	5	3	8	6	7	8	7	9	9	30	7	9	0		no	hollow heart	
AF1701- 3	7	7		6	9	9	5	3	8	7	5	8	2	9	9	26	8	9	0		no	hollow heart	
Ranger	7	6		7	9	9	5	4	8	7	7	6	6	9	9	2	6	9	0		ok+	?? yield	
AF1698- 4	6	5		7	9	9	7	7	9	8	2	2	4	9	9	0	4	9	0		no	bad	

(1) See NJ Rating Table for plant and tuber characters, tuber defects and chip color ratings.

(2) HH = No. of Hollow Heart tubers out of 40. HN = No. of Heat Necrosis tubers out of 40.

NJ Variety Table 9.

Yields, Specific Gravities, and Tuber Sizes for 14 Red or White Potato Varieties, Harvested Late and Grown on a Silt Loam Soil at the Synder Agricultural Research & Ext. Farm near Pittstown, NJ - 1996 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)				
			cwt/a	% of Sup.		1	7/8	2 1/2		1	2	3	4	5
Atlantic	cf	516	490	161	1.090	98		71	3	2	27	48	22	1
Salem-NY84	ct	452	418	137	1.066	96		67	4	4	29	39	27	0
NorDonna	ne	452	411	135	1.068	94		50	3	6	44	41	9	0
B0984- 1	cf	410	383	126	1.078	99		82	5	1	16	39	42	2
Cherry Red	ne	381	368	121	1.075	98		69	2	2	29	53	16	0
Yukon Gold	ne	366	353	116	1.069	98		72	1	2	25	49	23	1
B0852- 7	cf	366	333	109	1.071	97		66	6	3	30	46	20	0
Andover	ct	346	330	108	1.081	99		82	4	1	17	48	32	2
Superior	cf	338	305	100	1.076	97		71	7	3	26	64	6	0
Norland DR	ne	305	278	91	1.059	94		33	3	6	61	19	13	0
AF 875-15	ct	300	275	90	1.087	99		81	8	1	18	47	32	2
Red Ruby	ne	330	271	89	1.068	93		25	12	7	68	24	1	0
Redsen	ct	302	265	87	1.062	93		48	6	7	45	36	10	1
B0811- 4	cf	186	144	47	1.082	78		6	1	22	72	6	0	0
Grand Mean		361	330		1.074	95		59	5	5	36	40	18	1
CV (4)		13	14		.23	2		10						
W-D Bayes LSD.05		61	62		.003	2		8	3	2	8	9	11	ns

- (1) Plots were 21' long and 3' wide with 4 reps. Commercial cultural practices were used which included irrigation. Seedpieces were spaced at 9", planted on 5/15, and harvested on 9/26.
 (2) ct = Cert. Seed, cf = USDA Chapman Farm, ne = NE Regional Project.
 (3) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 1/2, S3= 2 1/2 to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.
 (4) CV=Coef of Variation; W-D Bayes LSD.05=Waller Duncan Test For Least Significant Difference.

NJ Variety Table 10. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings Grown near Pittstown, NJ - 1996 (1).

Variety	PLANT			TUBER CHARACTERS							TUBER DEFECTS							OVER		
	A	A	P	M	S	C	T	S	D	A	S	G	H	S	H	H	N	R	ALL	Comments
	p	p	p	t	S	l	x	h	p	p	G	C	S	G	S	N	R			
Atlantic	8	6		6	9	7	6	3	6	7	9	7	9	9	29	8	5		std	hollow heart
Salem-NY84	6	5		6	9	8	7	2	6	6	9	7	9	9	1	0			yes	big lectics
NorDonna	7	5		6	8	2	8	2	8	8	9	8	9	9	0	0			yes	good red color
B0984- 1	7	5		4	6	2	8	3	2	5	9	6	9	9	8	0			no	poor appearance
Cherry Red	8	3		3	9	2	8	4	6	8	8	7	7	9	13	0			yes	hollow heart
Yukon Gold	9	4		3	8	7	8	2	7	7	9	9	7	9	27	0			bad	hollow heart
B0852- 7	8	3		6	6	1	7	3	6	6	8	8	9	9	12	0			yes	dark purple
Andover	6	4		6	9	7	7	3	6	8	9	7	9	9	8	0			yes	some air cracks
Superior	8	5		4	9	7	7	5	5	7	9	7	9	9	0	0			std	poor appearance
Norland DR	7	1		1	8	2	8	4	6	7	9	9	9	9	2	1	8		std	
AF 875-15	6	5		6	9	8	8	2	5	6	8	7	9	9	12	0			no	hollow heart
Red Ruby	8	3		4	9	2	8	5	6	6	9	5	9	9	1	0			no	air cracks
Redsen	7	2		2	9	2	8	3	7	7	8	7	9	9	0	0			yes	the best red color
B0811- 4	5	2		2	8	2	8	2	8	7	9	9	9	9	0	0			yes	small red w/yel fl

(1) See NJ Rating Table for plant and tuber characters, tubers defects and chip color ratings.

(2) HH = No. of Hollow Heart tubers out of 40. HN = No. of Heat Necrosis tubers out of 40.

NJ Variety Table 11.

Yields, Specific Gravities, and Tuber Sizes for 110 Round White Potato Varieties, Harvested Mid-Season and Grown on a Sandy Loam Soil at the Rutgers Agricultural Res. & Ext. Center - Upper Deerfield, NJ - 1996 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)				
						% O v e r				% Tuber Sizes (3)				
						1	7/8	2 1/2		1	2	3	4	5
AF1569- 2	me	331	291	99	1.077	88	50	5	7	38	42	8	0	
AF1726- 9	me	374	328	112	1.070	88	44	6	6	44	40	4	0	
AF1753-12	me	369	335	114	1.070	91	42	1	8	49	41	2	0	
AF1763- 2	me	353	293	100	1.060	83	20	6	11	63	20	0	0	
AF1769- 1	me	342	292	99	1.088	86	45	12	3	40	44	1	0	
AF1769- 9	me	354	326	111	1.072	92	36	3	5	56	35	1	0	
AF1771- 1	me	429	375	127	--	87	54	11	2	33	44	10	0	
AF1771- 2	me	398	383	130	1.077	96	71	2	1	25	57	14	0	
AF1774-14	me	416	382	130	1.071	92	50	5	3	42	49	1	0	
AF1774-15	me	414	351	119	1.069	85	55	12	4	30	50	5	0	
AF1774-22	me	420	345	117	1.066	82	30	7	11	52	30	0	0	
AF1775- 2	me	365	294	100	1.086	80	30	16	4	51	29	1	0	
AF1787- 2	me	344	290	99	1.062	84	46	8	8	39	42	3	0	
B0985- 1	cf	169	145	49	1.061	86	23	6	8	63	23	0	0	
B1027- 6	cf	399	348	119	1.083	87	43	7	6	45	40	3	0	
B1029- 6	cf	380	332	113	1.077	87	49	5	7	38	38	11	0	
B1065-51	cf	378	348	118	1.068	92	63	5	3	29	60	3	0	
B1065-64	cf	374	342	116	1.070	91	52	4	4	39	47	5	0	
B1065-65	cf	316	251	85	1.072	79	28	10	11	52	28	0	0	
B1065-79	cf	315	245	83	1.077	78	13	10	12	65	13	0	0	
B1066-21	cf	433	364	124	1.077	84	33	7	9	51	32	1	0	
B1066-23	cf	491	400	136	1.078	81	49	14	5	32	42	7	0	
B1066-37	cf	237	206	70	1.076	87	26	4	9	61	22	3	0	
B1066-73	cf	456	391	133	1.081	86	65	12	2	21	47	18	0	
B1066-78	cf	342	313	106	1.075	91	63	2	6	28	52	11	0	

NJ Variety Table 11. (Continued.)

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% Over			% Culls	% Tuber Sizes (3)			
						1	7/8	2 1/2		1	2	3	4 5
B1066-97	cf	427	331	113	1.061	78	41	17	17	5	36	39	2 0
B1067-11	cf	489	311	106	1.073	64	49	34	34	3	15	35	14 0
B1067-23	cf	381	286	97	1.045	75	50	19	19	5	25	44	6 0
B1068-15	cf	311	277	94	1.076	89	25	4	4	7	64	25	0 0
B1068-49	cf	427	272	92	1.073	64	21	23	23	14	43	18	2 0
B1069-10	cf	306	270	92	1.085	88	28	4	4	7	61	26	1 0
B1072-21	cf	362	339	115	1.071	94	72	5	5	1	22	59	12 0
B1083-51	cf	308	271	92	1.079	88	46	9	9	3	42	45	1 0
B1090-19	cf	212	194	66	1.079	92	46	0	0	8	46	39	7 0
B1093-21	cf	296	271	92	1.079	92	46	5	5	4	45	44	2 0
B1098-32	cf	283	262	89	1.080	93	52	2	2	6	41	50	1 0
B1150-4	cf	514	469	159	1.063	91	58	5	5	4	33	50	8 0
B1206-10	cf	375	346	118	1.079	92	64	6	6	2	28	52	12 0
B1214-4	cf	265	219	75	1.077	83	45	9	9	8	38	42	3 0
B1214-7	cf	385	313	106	1.085	81	62	14	14	5	19	45	17 0
B1216-3	cf	402	245	83	1.067	61	22	36	36	3	39	19	3 0
B1240-14	cf	324	288	98	1.090	89	60	9	9	3	29	47	13 0
B1273-5	cf	388	331	112	1.079	85	50	7	7	8	35	40	10 0
B1279-4	cf	176	140	48	1.089	80	54	9	9	11	25	44	10 0
B1293-2	cf	278	243	83	1.072	88	43	8	8	5	45	41	1 0
B1293-3	cf	310	273	93	1.071	88	42	9	9	3	46	39	3 0
B1303-14	cf	369	305	104	1.110	83	77	14	14	4	6	17	59 0
B1307-23	cf	205	185	63	1.080	90	42	4	4	6	47	40	3 0
B1309-27	cf	283	250	85	1.085	89	28	2	2	9	61	26	2 0
B1315-31	cf	351	308	105	1.073	88	28	5	5	7	59	26	2 0
B1321-21	cf	420	372	127	1.084	89	53	6	6	6	35	44	10 0
B1321-22	cf	404	358	122	1.080	89	52	5	5	6	37	47	5 0
B1321-32	cf	305	270	92	1.088	89	36	1	1	10	52	34	3 0
B1321-38	cf	326	279	95	1.084	86	47	7	7	7	39	38	10 0
B1332-29	cf	245	214	73	1.072	88	41	6	6	6	47	41	0 0

NJ Variety Table 11. (Continued.)

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			% Culls	% Tuber			Sizes (3)		
						1	7/8	2 1/2		1	2	3	4	5	
B1339-22	cf	326	254	87	1.079	78	23	14	14	8	55	23	0	0	
B1339-26	cf	389	313	107	1.083	81	31	10	10	9	49	30	1	0	
B1342-21	cf	431	380	129	1.081	88	53	7	7	5	35	48	5	0	
B1344-18	cf	351	306	104	1.079	87	59	9	9	3	29	56	3	0	
B1360-16	cf	213	162	55	1.075	76	30	18	18	6	46	26	4	0	
B1370-14	cf	162	118	40	1.079	73	7	24	24	3	66	7	0	0	
B1384-15	cf	338	313	106	1.078	92	62	5	5	3	30	52	10	0	
B1389-17	cf	417	326	111	1.085	78	43	18	18	3	36	35	8	0	
B1399- 4	cf	344	296	101	1.075	86	41	9	9	5	45	36	5	0	
B1406-10	cf	357	304	103	1.079	85	49	6	6	9	36	41	7	0	
B1407- 8	cf	284	232	79	1.092	82	44	11	11	7	38	34	9	0	
B1414- 2	cf	351	328	111	1.081	93	59	2	2	5	35	46	13	0	
B1414- 6	cf	420	351	119	1.085	84	67	13	13	4	16	43	22	3	
B1415- 1	cf	353	311	106	1.087	88	47	4	4	8	41	41	6	0	
B1415- 5	cf	304	293	100	1.087	96	54	2	2	2	43	47	7	0	
B1415- 7	cf	351	311	106	1.085	89	57	8	8	3	32	42	15	0	
B1415- 8	cf	348	300	102	1.087	86	43	11	11	3	43	38	4	0	
B1416- 2	cf	413	390	133	1.088	94	67	3	3	3	28	51	15	0	
B1418- 2	cf	357	324	110	1.079	91	49	3	3	6	41	41	8	0	
B1418- 3	cf	349	313	107	1.082	90	39	3	3	7	50	38	1	0	
B1425- 7	cf	331	288	98	1.093	87	32	3	3	10	55	30	2	0	
B1425- 9	cf	384	358	122	1.085	93	32	0	0	7	62	32	0	0	
B1426-10	cf	331	255	87	1.082	77	38	15	15	8	39	36	3	0	
B1427- 4	cf	332	254	86	1.089	76	40	18	18	5	37	29	11	0	
B1427- 5	cf	380	332	113	1.082	87	56	7	7	5	31	43	13	0	
B1428- 1	cf	496	425	145	1.079	86	36	5	5	9	50	34	2	0	
B1428- 4	cf	311	246	84	1.100	79	44	10	10	10	35	39	5	0	
B1428- 8	cf	348	310	106	--	89	10	0	0	11	80	10	0	0	
B1429- 4	cf	248	218	74	1.088	88	58	5	5	7	30	40	18	0	
B1429-A2	cf	303	269	91	1.085	89	57	7	7	5	32	45	12	0	

NJ Variety Table 11. (Continued.)

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber			Sizes (3)		
			cwt/a	% of Sup.		1	7/8	2 1/2		1	2	3	4	5	
B1429-A3	cf	451	413	140	1.081	92		52	3	6	40	47	4	0	
B1429-A5	cf	278	254	86	1.074	91		45	3	5	47	42	3	0	
B1429-A6	cf	324	297	101	1.078	92		46	3	5	45	42	4	0	
NY 112	ny	465	447	152	1.074	96		77	0	3	19	64	13	0	
NY 114	ny	266	243	83	1.075	91		55	5	4	36	47	8	0	
NY 115	ny	664	629	214	1.077	95		68	1	4	27	41	25	2	
NY 117	ny	438	413	140	1.078	94		72	3	3	22	47	23	2	
NY P 5- 2	ny	339	297	101	1.075	88		37	7	6	51	32	5	0	
NY P13- 1	ny	363	323	110	1.080	89		66	9	2	23	49	18	0	
NY P13- 5	ny	365	330	112	1.070	90		57	5	5	34	50	7	0	
NY P21- 2	ny	440	393	134	1.066	89		55	4	7	34	45	11	0	
NY P21- 5	ny	312	279	95	1.083	90		27	1	10	63	27	0	0	
NY P21-12	ny	338	328	111	1.079	97		53	2	1	44	51	2	0	
NY P21-19	ny	293	285	97	1.078	97		57	1	2	40	55	2	0	
NY P21-20	ny	324	306	104	1.079	94		80	4	1	15	52	27	0	
NY P32- 3	ny	315	295	100	1.082	94		65	2	4	28	53	12	0	
NY P63- 1	ny	400	369	125	1.087	92		67	2	6	25	51	16	0	
NY P64- 3	ny	340	273	93	1.080	80		44	14	5	36	32	13	0	
NY P73- 1	ny	387	328	111	1.081	85		47	11	4	38	40	7	0	
NY P73- 2	ny	381	322	109	1.077	84		27	5	11	58	23	4	0	
NY Q 3-12	ny	325	290	99	1.077	89		53	4	7	36	36	17	0	
NY Q 8- 2	ny	353	305	104	1.081	86		61	10	4	26	45	13	2	
NY Q47- 1	ny	441	404	138	1.072	92		65	5	3	26	34	31	0	
Atlantic	ne	365	332	113	1.088	91		50	2	7	41	42	9	0	
Superior	ne	321	294	100	1.072	92		49	5	3	42	45	4	0	

(1) Plots were 21' long and 3' wide with 1 reps. Commercial cultural practices were used which included irrigation. Seedpieces were spaced at 9", planted on 4/19, and harvested on 8/6.

(2) ct = Cert., cf = USDA Chapman Farm, me = Univ. of Maine, ne = NE Reg Project, ny= Cornell.

(3) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 1/2, S3= 2 1/2 to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.

NJ Variety Table 12. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings Grown in Upper Deerfield, NJ 1996 (1).

Variety	PLANT				TUBER CHARACTERS							TUBER DEFECTS							OVER ALL	Comments				
	A	A	P	P	M	S	S	C	T	S	D	A	S	G	C	S	H	H			N	R	CC	
AF1569-2	7	6			4	7	7	6	7	3	7	7	7	8	9	9	9	0	0	1	8	3	ok+	nice chips
AF1726-9	7	4			5	5	8	8	8	2	7	7	7	8	8	9	9	0	0				ok+	small
AF1753-12	7	3			4	5	7	7	7	4	5	7	7	9	9	9	9	0	0	0		4	no	small
AF1763-2	6	4			2	8	8	7	7	2	6	6	6	7	9	9	9	0	0	0			no	smaller
AF1769-1	8	6			5	6	8	7	7	2	6	6	6	8	9	9	9	0	2	8			no	small
AF1769-9	6	2			3	7	8	7	7	2	7	7	7	9	9	9	9	0	0			3	ok+	early chipper
AF1771-1	7	7			6	5	7	6	6	2	6	7	7	8	9	9	9	0	0			7	yes	nice yield
AF1771-2	6	5			5	7	7	6	6	2	8	8	8	9	9	9	9	0	7	7		6	yes	heat necrosis
AF1774-14	8	7			6	5	8	8	8	5	7	5	5	8	9	9	9	0	0	0			no	poor shape
AF1774-15	5	6			4	7	7	6	6	3	6	6	6	9	9	9	9	0	6	6		8	no	heat necrosis
AF1774-22	6	7			7	7	8	8	8	2	6	6	6	8	9	9	9	0	5	7		8	no	heat necrosis
AF1775-2	8	6			7	5	8	7	7	2	6	6	5	6	9	6	9	0	0				no	poor appearance
AF1787-2	6	6			2	5	8	7	7	5	6	6	6	9	7	9	9	0	2	6			no	heat necrosis
B0985-1	5	2			3	6	2	7	7	2	7	7	7	8	7	9	9	0	0	0			no	small red
B1027-6	7	4			8	6	8	8	8	2	5	6	6	7	9	9	9	0	0			4	yes	good SG & chips
B1029-6	7	6			7	7	8	8	8	2	8	6	6	8	9	9	9	0	0			3	ok+	small chipper
B1065-51	6	5			3	6	6	5	5	2	7	8	8	9	8	9	9	0	0	0		6	yes	early
B1065-64	6	4			2	5	7	7	7	2	7	7	7	7	9	9	9	0	0	0			ok	some rot
B1065-65	6	2			3	7	7	8	8	2	7	6	6	9	7	9	9	0	0	0			no	some air cracks
B1065-79	7	2			3	7	8	7	7	4	7	6	6	7	9	9	9	0	0	0			no	some air cracks
B1066-21	7	7			9	6	8	7	7	4	6	6	6	7	9	9	9	0	0				ok	air cracks, late
B1066-23	9	7			5	2	8	7	7	2	8	8	8	8	7	8	7	1	0	0		5	yes	big yield
B1066-37	5	3			3	8	8	7	7	2	6	7	7	8	7	9	9	0	0	0		4	no	early
B1066-73	8	8			9	2	8	8	8	2	8	8	8	9	9	9	9	0	0	0		7	yes	very late
B1066-78	9	8			9	4	8	8	7	4	7	6	6	9	9	9	9	0	0	0		6	ok+	very late

NJ Variety Table 12. (Continued.)

Variety	PLANT				TUBER CHARACTERS							TUBER DEFECTS							OVER		Comments	
	A		P		M	S	C	T	S	D	A	S	G	H	S	H	H	N	R	CC		ALL
	p	p	t	s	s	l	x	h	p	p	a	g	c	s	s	s	s	r	c			
B1066-97	7	7	7	5	8	8	8	5	6	5	7	7	9	9	0	2	8			no	poor appearance	
B1067-11	7	6	6	3	8	8	8	2	8	6	9	8	9	9	0	0				no	air cracks	
B1067-23	8	6	7	1	8	8	8	2	7	6	9	9	9	8	1	1	8		3	ok+	too late	
B1068-15	6	4	5	8	6	5	5	2	8	7	8	9	9	9	0	0				no	low yield	
B1068-49	8	7	6	3	8	7	7	2	5	5	6	7	6	6	0	1	8			no	heat sprouts	
B1069-10	7	5	5	7	7	7	7	2	7	7	8	9	9	9	0	0				ok-	low yield	
B1072-21	6	5	6	7	8	7	7	3	6	6	8	9	9	9	1	0			5	ok+		
B1083-51	6	3	5	7	7	7	7	3	7	7	9	8	9	9	0	0			5	ok+	early	
B1090-19	5	2	6	8	6	5	5	2	8	8	9	9	9	9	0	0				no	low yield	
B1093-21	5	5	3	9	8	8	8	4	7	7	9	9	9	9	0	1	8		4	ok+	gone	
B1098-32	8	7	6	7	8	6	6	2	8	7	9	9	9	9	1	0				ok	no yield	
B1150-4	8	6	4	6	8	6	6	2	7	7	8	9	9	9	0	4	7		5	yes	good yield	
B1206-10	6	6	5	4	7	6	6	2	8	8	9	8	9	9	0	0			4	yes	yield + chips	
B1214-4	5	2	4	7	8	7	7	2	5	5	9	9	9	9	0	2	6		6	no	heat necrosis	
B1214-7	7	7	7	3	8	7	7	3	8	6	7	9	9	9	0	0				ok+		
B1216-3	7	5	5	6	7	6	6	2	7	7	8	9	9	9	1	3	8		3	ok	air cracks	
B1240-14	7	6	6	6	7	6	6	2	7	6	7	9	9	9	1	0			5	ok	so-so	
B1273-5	7	3	5	7	7	8	7	2	5	7	9	9	9	9	0	2	6			ok+	heat necrosis	
B1279-4	6	8	7	7	8	7	7	5	5	5	9	9	9	9	2	3	7			no	poor appearance	
B1293-2	5	4	3	7	8	8	8	2	4	5	9	9	9	9	0	8	5			no	heat necrosis	
B1293-3	5	3	2	8	8	7	7	3	7	6	7	7	9	9	0	7	6			no	heat necrosis	
B1303-14	5	6	5	5	8	7	7	3	6	6	9	6	9	9	0	0				no	air cracks	
B1307-23	5	7	6	7	8	7	7	2	7	6	7	8	9	9	0	1	8			no	low yield	
B1309-27	5	6	4	5	7	5	5	2	7	7	9	9	9	9	0	6	5			no	heat necrosis	
B1315-31	8	2	2	5	8	8	8	2	8	7	9	9	9	9	0	0				ok-	air cracks	
B1321-21	8	6	6	7	8	7	7	2	8	8	9	9	9	9	0	1	8		4	yes	nice	
B1321-22	7	6	7	4	7	7	7	2	8	8	8	9	9	9	0	0			5	yes	nice tubers	
B1321-32	6	7	5	7	7	7	7	3	8	7	9	9	9	9	0	1	8			ok-	small	
B1321-38	6	6	6	6	7	6	6	3	5	6	9	9	9	9	1	1	8			no		
B1332-29	6	2	3	7	8	8	8	2	5	6	8	9	9	9	0	3	6			no	heat necrosis	

NJ Variety Table 12. (Continued.)

Variety	PLANT			TUBER CHARACTERS							TUBER DEFECTS							OVER ALL	Comments	
	A	P	M	S	C	T	CHARACTERS			DEFECTS										
							S	h	D	A	S	G	C	S	H	H	N			R
B1339-22	6	7	7	6	8	7	4	5	7	9	9	9	9	0	1	8	3	ok	too small	
B1339-26	7	7	4	6	7	7	4	5	6	8	8	9	9	0	0			ok-		
B1342-21	7	6	6	5	8	7	2	6	7	9	9	9	9	0	1	8	6	yes	good yield	
B1344-18	6	4	5	6	8	7	2	7	7	9	9	9	9	0	0		5	yes	some air cracks	
B1360-16	8	6	7	5	8	7	2	5	6	9	9	9	9	5	0			no	hollow heart	
B1370-14	5	3	5	7	6	6	6	4	3	8	9	9	9	2	2	8		no	poor appearance	
B1384-15	8	7	7	6	8	7	3	7	7	9	9	9	9	0	2	8		yes	nice size	
B1389-17	8	8	8	3	8	7	5	7	5	8	8	9	9	0	0			no	late	
B1399-4	8	5	6	7	8	7	2	7	6	9	7	9	9	0	0			ok-	growth cracks	
B1406-10	8	6	5	4	8	7	2	8	7	7	9	8	1	0	0		8	yes	knobs	
B1407-8	7	6	3	5	8	7	2	6	6	8	9	9	9	0	4	6		no	heat necrosis	
B1414-2	7	8	7	1	9	9	2	8	8	9	9	9	9	0	0		4	yes	nice chips	
B1414-6	6	7	6	5	7	7	2	8	6	8	9	9	9	0	0		5	yes	high culls	
B1415-1	7	4	4	6	8	7	2	8	7	8	9	9	9	0	1	8		6	no	defects
B1415-5	6	3	4	7	4	7	3	8	8	9	9	9	9	0	0		6	yes	nice tubers	
B1415-7	7	7	8	2	8	8	2	8	8	9	7	9	9	0	0		3	yes	chips	
B1415-8	8	7	8	5	8	8	5	5	6	8	9	9	9	2	0			no	hollow heart	
B1416-2	7	7	5	7	8	7	2	6	8	7	9	9	9	1	0		3	yes	nice chips	
B1418-2	6	6	6	7	7	7	1	9	8	8	9	9	9	0	1	8	3	yes	early chipper	
B1418-3	6	7	6	6	8	7	2	8	7	9	9	9	9	0	0			ok+	small	
B1425-7	7	6	7	8	7	6	2	6	5	8	9	9	9	0	0			no	poor appearance	
B1425-9	8	4	5	7	8	8	2	7	8	9	9	9	9	0	0		4	yes	high yield	
B1426-10	7	7	5	7	6	6	2	6	4	7	7	9	9	0	3	8		no	defects	
B1427-4	7	4	5	7	8	8	2	7	6	6	6	9	9	0	0			ok	air cracks	
B1427-5	8	6	7	7	7	7	2	6	6	9	9	9	9	0	0		5	yes	poor appearance	
B1428-1	7	3	3	7	7	6	2	8	6	7	9	9	9					yes	small	
B1428-4	7	7	5	8	7	5	2	5	5	9	9	9	9	0	0			ok	high gravity	
B1428-8	7	4	6	8	7	6	2	8	8	9	9	9	9	0	0		5	ok	too small	
B1429-4	5	5	5	7	7	6	2	8	6	8	9	9	9	0	0			no	many culls	
B1429-A2	7	7	6	3	8	7	2	7	7	9	7	9	9	0	0		4	ok	growth cracks	

NJ Variety Table 12. (Continued.)

Variety	PLANT				TUBER CHARACTERS					TUBER DEFECTS					OVER		Comments				
	A	P	M	S	S	C	T	S	D	A	S	G	C	S	H	H		N	R	CC	ALL
B1429-A3	8	6	4	7	8	7	2	7	8	9	9	9	9	0	0				3	yes	good yield
B1429-A5	6	5	3	4	8	8	2	5	6	9	9	9	9	0	0					ok-	appearance
B1429-A6	6	4	5	7	8	6	2	8	8	9	9	9	9	0	3	8			3	ok+	so-so
NY 112	7	6	6	6	7	6	2	7	6	9	9	9	9	0	0				3	yes	very good
NY 114	6	4	5	5	8	7	2	7	7	7	7	9	9	0	0					ok+	late good size
NY 115	5	6	4	7	8	8	2	7	7	8	9	9	9						3	yes	good yield/size
NY 117	8	4	4	6	8	8	3	7	7	9	9	9	9	0	0				3	yes	good chips
NY P 5-2	8	3	4	3	8	8	2	6	6	7	7	9	9	0	0					no	air cracks
NY P13-1	8	4	5	2	8	8	2	3	5	8	9	9	9	1	0				5	ok	poor appearance
NY P13-5	7	4	5	2	8	8	2	6	7	9	9	9	9	0	4	8			5	ok+	some rot
NY P21-2	7	5	5	5	8	7	2	8	6	9	9	9	9	0	0				3	yes	good size
NY P21-5	8	6	6	8	7	6	2	8	8	9	9	9	9	0	2	8				ok-	second growth
NY P21-12	6	3	4	7	6	6	3	6	6	8	9	9	9	0	0				3	ok+	small
NY P21-19	6	6	5	6	7	6	2	8	7	9	9	9	9	0	0				3	ok+	variable
NY P21-20	7	4	4	5	7	6	2	9	8	9	8	9	9	0	0				4	no	air cracks
NY P32-3	6	6	5	5	8	8	2	6	7	9	9	9	9	0	0				3	ok+	good size & chips
NY P63-1	7	4	4	7	8	7	2	5	7	9	9	9	9	1	0				3	yes	good chips
NY P64-3	7	4	4	5	8	8	2	6	6	9	9	9	9	0	0					no	poor yield
NY P73-1	7	6	5	2	8	7	3	7	7	9	9	9	9	1	0				5	ok+	bruises
NY P73-2	6	7	6		8	8	3	5	5	9				0	2	8			4	ok	small
NY Q 3-12	6	7	5	7	8	6	2	8	8	8	9	9	9	0	0				3	ok+	very big
NY Q 8-2	6	6	4	4	8	7	2	7	6	9	9	9	9	0	0					yes	big tubers
NY Q47-1	6	4	3	6	8	7	3	7	6	9	9	9	9	0	1	7			4	yes	poor appearance

(1) See NJ Rating Table for plant and tuber characters, tubers defects and chip color ratings.

(2) HH = No. of Hollow Heart tubers out of 10. HN = No. of Heat Necrosis tubers out of 10.

NJ Variety Table 13.

Yields, Specific Gravities, and Tuber Sizes for 38 Potato Varieties, Harvested Late and Grown on a Silt Loam Soil at the Synder Agricultural Research & Ext. Farm near Pittstown, NJ - 1996 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)				
						1	7/8	2 1/2		1	2	3	4	5
B0564- 9	cf	426	390	126	77	98	82	82	6	2	16	51	32	0
B0852- 7	cf	398	382	123	83	99	70	70	3	1	29	56	12	3
B0766- 3	ny	463	393	127	85	99	83	83	14	1	16	33	49	0
B0984- 3	cf	315	268	87	65	95	75	75	11	5	20	44	21	10
B0985- 1	cf	276	243	79	66	95	46	46	7	5	49	39	7	0
B1102- 3	cf	281	232	75	72	85	17	17	3	15	68	17	0	0
B1300- 2	cf	471	384	124	79	93	38	38	12	7	54	37	1	0
B1401- 1	cf	366	333	108	76	97	44	44	6	3	54	33	11	0
B1401- 5	cf	337	297	96	84	93	46	46	6	7	48	35	11	0
B1402- 1	cf	389	266	86	84	92	43	43	26	8	49	37	6	0
B1409- 2	cf	409	367	118	87	96	54	54	7	4	42	43	10	0
B1409- 3	cf	373	296	95	81	89	45	45	11	11	44	45	0	0
NY 107	ny	408	369	119	84	96	77	77	6	4	19	45	33	0
NY 108	ny	404	381	123	79	99	88	88	5	1	11	22	52	15
NY 109	ny	431	388	125	69	99	80	80	9	1	19	51	29	0
NY 111	ny	348	315	101	90	95	59	59	5	5	36	51	8	0
NY 114	ny	419	387	125	79	99	83	83	7	1	16	39	39	5
NY 115	ny	394	377	122	78	98	78	78	2	2	19	45	32	2
NY L235-4	ny	537	418	135	79	96	67	67	19	4	29	44	23	0
NY P13- 1	ny	488	480	155	88	99	86	86	1	1	13	32	52	2

NJ Variety Table 13. (Continued.)

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			% Culls	% Tuber			Sizes (3)		
						1	7/8	2 1/2		1	2	3	4	5	
NY P13-5	ny	491	479	155	72	99	78	1	1	20	39	30	9		
NY P21-2	ny	527	489	158	85	100	94	7	0	6	19	65	10		
NY P21-5	ny	425	373	120	74	97	77	10	3	21	47	27	3		
NY P21-9	ny	521	508	164	82	98	91	1	2	8	33	51	7		
NY P21-12	ny	451	400	129	90	98	87	10	2	11	47	40	0		
NY P21-19	ny	418	410	132	83	99	85	1	1	14	42	23	20		
NY P21-20	ny	469	429	139	78	99	89	7	1	10	28	50	11		
NY P32-3	ny	392	380	122	84	99	80	2	1	18	41	32	8		
NY P63-1	ny	449	409	132	81	95	72	4	5	23	33	35	5		
NY P63-2	ny	427	413	133	84	98	72	1	2	26	55	17	0		
NY P64-3	ny	382	299	97	76	96	68	19	4	28	41	27	0		
NY P73-1	ny	414	389	126	76	97	65	3	3	32	44	21	0		
NY P73-2	ny	436	420	135	86	97	40	0	3	57	40	0	0		
NY Q 3-13	ny	133	131	42	83	98	94	0	2	4	5	74	16		
NY Q 8-2	ny	565	529	171	79	99	93	6	1	6	11	62	20		
NY Q38-1	ny	190	165	53	74	87	16	0	13	71	16	0	0		
NY Q38-2	ny	381	324	104	89	91	51	7	9	40	36	16	0		
NY Q47-1	ny	372	342	110	71	96	88	5	4	9	34	54	0		

(1) Plots were 21' long and 3' wide with 1 reps. Commercial cultural practices were used which included irrigation. Seedpieces were spaced at 9", planted on 5/15, and harvested on 9/26.

(2) cf = USDA Chapman Farm, ny = Cornell University.

(3) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 1/2, S3= 2 1/2 to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.

NJ Variety Table 14. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings Grown near Pittstown, NJ - 1996 (1).

Variety	PLANT				TUBER CHARACTERS								TUBER DEFECTS								OVER		Comments
	A	A	P	M	S	S	C	T	S	h	D	A	S	G	H	H	H	N	R	CC	ALL		
B0564- 9	8	3	3	3			7	6	2	7	7	7	8	9	9		2	0				yes	nice appearance
B0766- 3	6	8	7	7	9		8	8	2	8	6	6	9	9	9		1	0				ok	so-so
B0852- 7	8	4	7	9	9		1	8	2	8	8	8	9	8	9		5	0				ok+	ok purple
B0984- 3	7	4	3	9	9		3	8	3	7	6	6	6	7	9		0	0				no	yellow flesh
B0985- 1	6	2	2	9	9		2	8	2	7	8	8	8	7	9		0	0				no	small red
B1102- 3	6	2	3	9	9		2	8	2	7	7	7	9	7	9		0	0				no	very small
B1300- 2	7	7	6				5	4	7	6	4	4	8	7	9		6	0				no	hollow heart
B1401- 1	8	6	4	9			5	3	9	5	6	6	9	8	9		1	1	7			no	heat necrosis
B1401- 5	7	6	5	9	9		5	3	8	5	6	6	9	8	9		8	0				no	hollow heart
B1402- 1	7	7	6	9	9		5	3	8	6	5	5	7	7	9		6	5	2			no	heat necrosis
B1409- 2	7	7	7	9	9		5	3	8	7	5	5	9	7	9		2	0				no	poor appearance
B1409- 3	9	7	5	9	9		6	6	8	6	4	4	6	5	9		3	0				no	growth cracks
NY 107	8	5	5	9	9		8	7	2	7	7	7	8	9	9		0	1	6			yes	high gravity
NY 108	5	4	5	9	9		7	6	2	8	8	8	9	8	9		1	0				yes	nice appearance
NY 109	7	6	5	9	9		8	8	4	6	8	8	9	9	9		0	0				yes	nice appearance
NY 111	8	6	6	9	9		8	8	2	6	7	7	9	9	9		1	1	5			ok	small
NY 114	5	7	8	9	9		7	6	2	6	7	7	9	8	9		1	0				yes	late
NY 115	6	6	5	9	9		8	8	2	6	7	7	9	8	9		1	0				yes	good size
NY L235-5	8	7	7	9	9		7	7	2	5	6	6	9	3	9		0	0				no	bad growth cracks
NY P13- 1	8	7	6	9	9		8	8	2	5	6	6	9	9	9		1	0				yes	poor appearance

NJ Variety Table 14. (Continued.)

Variety	PLANT				TUBER CHARACTERS								TUBER DEFECTS					OVER		Comments				
	A		P		S	S	C	T	x	h	p	D	A	S	G	C	S	H	H		N	R	CC	ALL
	p	p	M	t	S	S	l	x																
NY P13- 5	8	7		7			8	8		2	6	8			8	8	9		0	0			yes	good size
NY P21- 2	7	4		6	9		8	8		2	6	6			7	9	9		0	0			yes	good size
NY P21- 5	7	5		6	9		8	7		2	8	8			7	9	9	1	0	0			ok+	second growth
NY P21- 9	7	6		6	9		8	7		3	7	6			9	8	9	0	0	0			yes	good size
NY P21-12	5	6		7	9		7	6		5	5	5			9	7	9	3	0	0			no	hollow heart
NY P21-19	5	7		7	9		7	6		3	6	7			9	9	9	1	0	0			yes	big tubers
NY P21-20	5	7		6	9		7	6		2	7	7			8	7	9	1	0	0			no	growth cracks
NY P32- 3	6	7		6	9		8	8		2	6	7			9	9	9	3	0	0			no	hollow heart
NY P63- 1	7	7		7	9		8	8		2	6	7			9	9	9	7	1	5			yes	hollow heart
NY P63- 2	7	6		5	9		8	7		2	8	8			9	9	9	2	0	0			ok+	nice appearance
NY P64- 3	4	4		7	9		8	8		2	5	5			7	6	5	4	0	0			no	heat sprouts
NY P73- 1	8	4		5	9		8	7		4	6	6			9	7	9	6	0	0			no	hollow heart
NY P73- 2	8	7		8	9		8	8		7	6	7			9	9	9	1	0	0			ok+	small
NY Q 3-12	6	6		7	9		8	8		2	7	7			9	9	9	0	0	0			ok	very big tubers
NY Q 8- 2	7	6		7	9		7	7		2	7	6			7	9	9	2	0	0			yes	big tubers
NY Q38- 1	6	5		6	9		7	7		5	6	7			9	9	9	0	0	0			no	too small
NY Q38- 2	7	5		5	9		8	7		5	5	6			9	9	9	8	0	0			no	hollow heart
NY Q47- 1	8	3		6	9		8	8		3	5	7			9	6	9	0	0	0			ok-	growth cracks

(1) See NJ Rating Table for plant and tuber characters, tubers defects and chip color ratings.

(2) HH = No. of Hollow Heart tubers out of 10. HN = No. of Heat Necrosis tubers out of 10.

NJ Rating Table. Rating Codes For Plant and Tuber Characters, Tuber Defects, and Chip Color Ratings.

Ap = Appearance	Cl = Color	Ap = Appearance	HH = Hollow Heart
AP = Air Pollution	Tx = Texture	SG = Second Growth	HN = Heat Necrosis
Mt = Vine Maturity	Sh = Shape	GC = Growth Crack	R = Heat Necrosis Rating
SS = Tuber Skin Set	Dp = Depth	HS = Heat Sprouts	CC = Chip Color

Plant & Tuber Appearance (Ap)	Foliar Disease Rating (AP)	Vine Maturity (Mt)	Tuber Skin Set (SS)	Tuber Color (Cl)	Tuber Texture (Tx)
1. very poor	1. dead	1. very early	1. very poor	1. purple	1. part russet
2. poor	2. very severe	2. early	2. poor	2. red	2. hev. russet
3. fair	3. severe	3. medium	3. poor	3. pink	3. mod. russet
4. good	4. moderate	4. late	4. fair	4. dark brown	4. lgt. russet
5. excellent	5. slight	5. very late	5. good	5. brown	5. net
	6. very slight		6. excellent	6. tan	6. slight net
	7. none			7. buff	7. mod. smooth
				8. white	8. smooth
				9. bright white	9. very smooth

Tuber Shape (Sh)	Tuber Depth (Dp)	Tuber Disease Rating (SG, GC, HS, HN)	Wise Foods Chip Color (CC)	Heat Necrosis Rating (R)
1. very round	1. very flat	1. very severe	1. paper white	1. very bad
2. mostly round	2. flat	2. severe	2. acceptable	2. very bad
3. round to oblong	3. ok	3. moderate	3. borderline	3. unacceptable
4. mostly oblong	4. good	4. borderline	4. unacceptable	4. borderline
5. mostly oblong	5. very slight	5. very slight	5. black chip	5. slight
6. oblong to long	6. very round	6. none		6. none
7. mostly long				
8. very long				
9. very long				

New York

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Early Generations

The crossing program produced 11 round white combinations with chipping and tablestock potential, 8 red combinations, 50 trichome hybrids, 6 segregating for resistance to late blight and five races of cyst nematodes, and 51 combinations segregating for resistance to two races of *Globodera rostochiensis*.

Seeds produced in 1995 (U's) were sown and the seedlings were transplanted to six inch pots. Four tubers were saved from each, after selecting for tuber color in the trichome and red progenies. There were 7385 round whites, 1051 reds, 2654 *Globodera pallida* resistant, 3569 with *Pratylenchus penetrans* resistance and 4526 with trichomes.

The four hill seedling populations (T's) started with 3032 round whites. At harvest 494 were selected for tuber type, then stored at 45° for one month prior to chipping and testing for resistance to the golden nematode. The 2029 reds were selected for shape and tuber color, then golden nematode resistance, and 143 saved.

The 8,201 trichome clones were selected for tuber type at harvest, then for chip color and resistance to the golden nematode. The latter test is incomplete, but 501 are expected to be saved.

The third year generation (S's) consisted of 2061 clones in 24 hill plots. At harvest 214 were saved and the following winter evaluations were made for chip color, specific gravity, golden nematode resistance.

Intermediate Generations

The fourth year selections (R's) were grown as 100 hill plots for seed production and selection and in two row by 20-foot plots for observation and chip samples. From the 74 that were grown, 15 have survived the fall selection and post harvest tests.

The fifth generation (P's and Q's) were grown in 400 hill seed plots and a replicated yield trial. The 20 at this stage of selection were reduced to 7 and are being introduced to virus-free *in vitro* production. All are round white clones and five have chipping potential.

Advanced Generations

A summary of the performance of the most advanced clones is as follows:

NY84 = D146-11 = Rosa x NY66 (1980). Midseason tablestock. High yielding and scab resistant. Yield at Ellis Hollow and Mt. Pleasant over six seasons was 105% of Atlantic. In five seasons at Riverhead, NY84 yielded an average of 115% of Katahdin and Norwis

yielded 141% of Katahdin. In 1995 and 1996, at two additional upstate sites, NY84 yielded 118% of Katahdin. Bright skin. Nice shape, slightly flat. Early emerging, attractive vigorous vine. Early sizing. In nine seasons, yields on August 1 were 91% of Superior. Few pickouts and internal defects. Specific gravity like Monona. Good cooking qualities, slight yellowish cast when boiled. Slight sloughing. Tuber dormancy two weeks longer than Katahdin or Atlantic. Resistant to golden nematode and good scab resistance. There were 46 acres of foundation seed produced in NY in 1996. This will be the last season of entry in replicated yield trials. NY84 will be named Salem.

NYE11-45 = Rosa x Q155-3 (1981). Midseason to late season chipstock and tablestock. High yields and scab resistant. Yield at Ellis Hollow and Mt. Pleasant over eight seasons was 106% of Atlantic and 128% of Monona in eight years in Steuben and Wyoming Counties. In five seasons at Riverhead, NYE11-45 yielded an average of 117% of Katahdin and Norwis yielded 141% of Katahdin. In 1995 at six upstate sites, NYE11-45 yielded 117% of Atlantic and in 1996 at five upstate sites NYE11-45 yielded 116% of Atlantic. Bright white skin. Attractive shape, somewhat flattened. Tends to set heavy with small to medium tuber size. Generally few internal defects and pickouts. Specific gravity and dormancy like Monona. Acceptable boiling qualities. Chip color equal to Atlantic from the field and generally better than Monona from storage at 45°. Resistant to the golden nematode. Scab resistance like Monona. There were 45 acres of foundation seed produced in 1996 in NY. This will be the last season of entry into replicated yield trials. The future will depend on further interest in NY, PA and Ohio.

Pike = NYE55-35 = Allegany x Atlantic (1981). Mid-late season chipstock with high specific gravity and very good scab resistance. Yield of US. #1 in seven years on Mt. Pleasant and Ellis Hollow in cwt/A = Pike = 372, Atlantic = 376. In 1995, at six upstate sites Pike yielded 97% of Atlantic and 103% to Snowden. At two upstate sites in 1996 Pike yielded 178% of Atlantic and 90% of Snowden. Tends to have about 40% in the 1-7/8" to 2-1/2" size. 10" spacing seems to give best yield and size. Irrigation improves yield without much effect on tuber size. Generally free of pickouts and hollow heart. Attractive tuber shape. Netted skin, free of blemishes. Specific gravity equal to Atlantic and Snowden. Good chip color from 45° storage. Good early vine growth, medium vigor at end of season, but better than Monona. Resistant to the golden nematode and very resistant to scab, comparable to Superior. In 1995, internal heat necrosis occurred at some locations. The necrosis was net-like and generally in the center of the tuber. It is not a reaction to leafroll virus. This was not a problem in 1996. There is less hollow heart than in Atlantic and Snowden. So far interest has been greater in the Midwest than the Northeast. The future appears to be favorable where the combination of chip color, high specific gravity, and excellent scab resistance are important.

Andover = NYE55-44 = Allegany x Atlantic (1981). Early to midseason table and chipstock. Very

rapid emergence and early set. In nine trials in Ellis Hollow during the past eight years, Andover has produced 274 cwt/A in early August and Superior 273 cwt/A. At full season on Mt. Pleasant and Ellis Hollow for eight seasons, Andover has produced 87% of Atlantic. In 1995 at six sites, Andover had a US #1 marketable yield 92% that of Atlantic. The cool wet season of 1996 was particularly favorable for Andover. It showed no signs of stress, stayed green until harvest, and yielded 95% of Atlantic. Andover appears to be susceptible to drought and heat stress. Attractive tuber shape. Skin texture like Superior. Large tuber size. Yields of Andover at 6" was better than at 9" in 1995 and 1996. Small percentage of pickouts. Hollow heart has not been a problem until 1996 when an amount less than in Atlantic appeared in the 4" size tubers. The narrower spacing reduced this defect. Specific gravity is higher than Superior, about .009 less than Atlantic. Excellent chip color from the field under a range of environments, from 48° and 45° storage and from 40° with reconditioning. Good boiling and baking properties. The mealiness of the baked potatoes appears to be greater than expected for its specific gravity. Tuber dormancy is two weeks longer than Atlantic. Exceptionally rapid early growth, but vines tend to decline in mid August. May be sensitive to air pollution. Scab reaction like Monona. Resistant to golden nematode and possibly to powdery scab. The unique earliness, excellent chipping properties, and desirable appearance and cooking qualities offer considerable promise for this clone.

NY87 = F24-12 = Monona x Allegany (1982). Mid-late season chip and tablestock. High yields, early sizing, and large tuber size. At 3 Ithaca locations over 8 years, the marketable yield of NY87 was 104% of Atlantic. In five seasons at Riverhead, NY87 yielded an average of 116% of Katahdin and Norwis yielded 133% of Katahdin. In 1996 at six upstate sites, NY87 yielded 114% of Atlantic. Early sizing: 93% of yield of Superior in early August (seven years). Very few pickouts. Some hollow heart in large tubers, but less than Atlantic. Good tuber shape and bright skin. Appearance better at narrower spacing. Specific gravity better than Monona (.013 less than Atlantic in 85 trials compared with .020 less than Atlantic for Monona). Good chip color and 45° storage. Two weeks longer dormancy than Katahdin and Atlantic. Nice vine type with large leaflets. Good boiling quality. Resistant to golden nematode and scab resistance like Monona. NY87 will be named Reba.

NY101 = K7-1 = Steuben x Norwis (1986). Mid-late season tablestock. Pale yellow flesh. Scurfy skin. Exceptionally high yields of large round tubers. Yield at Mt. Pleasant and Ellis Hollow for six seasons has been 109% of Atlantic. At four sites in 1995, NY101 yielded 114% of Atlantic and at two sites was 151% of Katahdin. At four sites in 1996 the yield was 124% of Atlantic. Early sizing. Large tuber size. Very round. Very few pickouts. In prior years there have been few defects upstate, but in 1995 internal necrosis occurred in two Ithaca trials. This was not a problem in 1996. Internal necrosis has been observed in Riverhead trials. Scab resistance like Superior. Specific gravity like Katahdin.

Very nice vine growth and appearance. Resistant to golden nematode. The excellent yield, tuber shape, and eating quality of this clone merit its evaluation for markets which will accept yellow flesh.

NY102 = K9-29 = Steuben x Kanona (1986). Midseason chipstock. Yields 97% of Kanona in six trials in 1993, 94% of Kanona in five trials in 1994, and equal to Kanona in 1995. Small-medium tuber size. Very few pickouts. Bright skin. Scab resistance between Monona and Superior. Specific gravity like Atlantic. Very good chip color from 45° storage. The 1994 crop had average chip scores from field and 45° storage of 3.2 for NY102, 3.0 for Snowden, and 3.8 for Kanona. Tuber dormancy two weeks longer than Monona. Fair vine growth. Resistant to golden nematode. Due to mosaic in our 1995 seed, we did not evaluate this clone in 1996 except at Freeville where it performed as well as Atlantic for yield and specific gravity. It will be included in 1997 trials.

NY103 = K88-24 = Steuben x (Neotbr x tbr) (1986). Midseason table and chipstock. Yield of US #1 relative to Atlantic was 91% at five upstate sites in 1993 and was 118% at seven upstate sites in 1994, 114% at six sites in 1995, and 110% at six sites in 1996. The average of 24 tests was 109%. In three years at Riverhead, NY103 yielded 108% of Katahdin. Outstanding tuber appearance. Very bright, blemish-free skin. Round shape. Medium sized tubers. Almost free of pickouts and internal defects. Scab resistance like Monona. Tuber dormancy seven weeks longer than Katahdin and Monona. Nice vine type. Specific gravity is .013 less than Atlantic (27 trials, 4 years). Chip color is like Monona. In 1994 after 45° storage the Agron for NY103 was 54 compared with 55 for Monona. And in 1995, the Agron for NY103 and Snowden were both 60. Resistant to the golden nematode, PVX, and PVY. Though data are limited, it appears that NY103 is tolerant of environmental stresses. This is a unique clone with exceptional tablestock and very good chipping qualities, deserving special attention.

NY109 = M19-3 = Allegany x Q155-3 (1988). Mid early tablestock. Full season marketable yields in 1995 and 1996 were 106% of Atlantic, early yield in 1995 and 1996 was 106% of Superior. Yield at Riverhead in 1995 and 1996 was 122% greater than Superior and 104% of Norwis. Large tuber size. Fewer pickouts than Atlantic. Very little brown center and hollow heart. No internal necrosis in 1994, but equal to Atlantic in 1995. Exceptionally attractive tuber shape. Very bright skin with prominent lenticels, occasionally infected. Specific gravity in five years is .020 less than Atlantic. Scab resistance like Superior. Attractive vine. Resistant to the golden nematode. The major possible weakness of this clone is the prominent lenticels at harvest time.

NY110 = M28-3 = Pike x Q155-3 (1988). Late season tablestock. Full season marketable yields in upstate trials in 1994, 1995 and 1996 were 92% of Atlantic. The yield at Riverhead in 1995 and 1996 was 121% of Katahdin and 104% of Norwis. It has been exceptionally free of internal defects at Riverhead and

upstate both years. Tuber size is very large. Early harvest and yield in 1995 and 1996 was 118% of Superior. Bright skin. Specific gravity in five years has been .011 less than Atlantic. Scab resistance is similar to Monona. Medium plant size, rugose leaflets. Resistant to the golden nematode. Save for further evaluation on Long Island.

NY112 (P7-19) Allegany x Q155-3 (1990).

Late maturity chipstock and tablestock. Very scurfy skin texture, but attractive round shape. Outstanding yield. Marketable yields in 1994, 1995, and 1996 at Ithaca 116% of Atlantic. In five upstate trials in 1996, the marketable yield was 128% of Atlantic. Specific gravity is .008 less than Atlantic (8 trials). Tuber size is like Atlantic. Few pickouts, but hollow heart may be a problem in the larger tubers. Large vines. White flowers. Golden nematode resistant. Scab resistance like Superior. Very promising except for risk of hollow heart.

NY115 (P23-31) Pike x NY88 (1990).

Medium maturity chipstock and tablestock. Large tuber size. Early sizing. Attractive, bright tubers. Marketable yields in upstate trials 1994, 1995, and 1996 was 96% of Atlantic. Few pickouts and internal defects. Scab resistance like Monona. Golden nematode resistant. White flowers. Attractive vine. Specific gravity is .012 less than Atlantic. Outstanding chip color in 1995 and 1996.

1996 Results of Potato Variety and Cultural Practices Studies on Long Island, New York

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Introduction:

Experiments conducted in 1996 are part of an ongoing program evaluating promising golden nematode resistant and russet- and red-skinned potato clones under Long Island conditions. Forty-seven potato clones were evaluated in replicated experiments conducted at the Long Island Horticultural Research Laboratory (LIHRL). In addition, eighty-one white-, three red- and six russet-skinned clones were included in an observation trial. Data were collected on total and marketable yields, size distribution, internal and external defects, and general appearance of potato tubers.

Methods:

The randomized complete block design with four replications was used in all the experiments. Variety plot size was 2 rows by 12 feet. Fertilizer was applied at a rate of 1,000 lbs/A of 10-20-20 in bands at time of planting (4/23-24/96). An additional 60 lbs N/A were applied when plants were 4 to 6 inches tall. The early experiment was rated for vine maturity on 8/14/96, plants were roto-cut on 8/15/96 and yield data were collected on 8/20/96. Vines in other experiments were vine killed on 9/10/96 and were harvested on 10/1 and 10/8/96. Specific gravity was determined by the hydrometer method. Internal defects were determined on 10 tubers per replication in the 3.3 to 4 inch or 12 to 16 oz. categories for round and russet experiments, respectively. Tables summarize maturity ratings, tuber appearance and shape. Vine maturity ratings were based on a scale of 1 to 9, 1 = completely dead, 9 = green and vigorous. Appearance ratings were based on a scale of 1 to 9, 1 = extremely poor, 9 = excellent appearance. Shape abbreviations are R = round, O = oblong, L = long. Other data on tuber appearance, shape, skin color and texture and eye-depth are listed in Table 1.

Abbreviations for the descriptions are also listed for that table. An experiment to determine the effect of nitrogen rate and spacing on vigor and yield of NY103, NY109 and E11-45 was established on 4/24/96. Plot size was 3 rows x 15 feet long with the center row x 12 feet used for data. All plots were fertilized at a rate of 1,000 lbs/A of 10/20/20 in bands at planting. Sidedress nitrogen treatments of 0, 50, 100 lbs/A were

applied on 6/11/96. NY103 and NY109 were spaced at 6 and 9 inches. E11-45 was planted at 9 and 12 inches. Plants were vine killed on 9/10/96 and harvested on 10/7/96.

The average monthly high and low temperatures during the 1996 growing season were close to the twenty year averages. They were in sharp contrast to the past three years which were considerably hotter than average. Rainfall was more evenly distributed than the recent past. Even so, 19.3 inches of irrigation were applied.

Early White-Skinned Clones:

There were no significant differences in total yield of Superior, Onaway, AF1331-2, AF1424-7, AF1438-6 and NY87 (Tables 2 & 3). The marketable yield of Superior and NY87, however, was significantly higher than that of the other clones. AF1424-7 had the highest specific gravity. Sunrise and NY87 had the best appearance. Onaway and AF1331-2 had the worst appearance and most defects.

NE 107 White-skinned Clones:

The highest marketable yield was produced by Katahdin, Atlantic, Snowden, AF1438-5, NY87 and NY103 (Tables 4 & 5). Internal defects plagued Katahdin, Atlantic, Niska, AF1331-2, AF1438-5, AF1455-9, B0564-9, NY87 and NY99. Tubers of NY99 had the highest appearance rating. Tubers of this line are oblong to long with shallow lateral and apical eyes. Other lines with good appearance were AF1438-5, AF1455-9 and NY103. Atlantic and W870 tubers had the highest specific gravity; AF1438-5 the lowest.

White-skinned Entries from Northeast Potato Breeding Programs:

Katahdin, Norwis, B0766-3, B0856-4 and NY110 produced the highest total yield (Tables 6 & 7). The best marketable yield was produced by Superior, Norwis, B0564-9, B0766-3, NY103, NY110, NY114 and NY117. Tubers of the latter line also had the highest specific gravity. The best appearance scores were given to NY103 and NY115. Internal defects were prevalent in Katahdin, Norwis, B0564-9 and B0766-3.

Red-skinned Clones:

Chieftain produced the highest total marketable yields (Tables 8 & 9). Although this variety has consistently produced high yields of relatively attractive tubers, the skin color is generally light red and tends to "feather". There were no differences in the yield, appearance or skin color between two sources of Dark Red Norland. Several lines may be well suited for niche markets. B0811-13 is a dark red, netted line with moderately deep eyes and a deep yellow flesh. Tubers of B0852-7 and B0967-11 have smooth purple skin and shallow eyes, and an attractive appearance. The specific gravity of tubers of B0967-11 and B0984-1 was the highest in the experiments.

Russet-skinned Clones:

Century Russet was the outstanding performer in the russet experiment (Tables 10 & 11). It produced the highest total and marketable yields and tuber specific gravity. Tubers of this variety are long, attractively netted with slightly depressed lateral eyes. Internal defects were noted for each of the entries. Bel Rus, Century Russet and B0835-11 had the least; B9922-11 and Russet Norkotah had the most.

European Variety:

The yield and/or appearance of two white-skinned clones, Latona and Morning Gold, and two red-skinned clones, Redstar and Symfonia developed in Europe was disappointing (Tables 12 & 13).

Observation Trial:

Data from a non-replication trial on yield, appearance, specific gravity and internal defects of early selection clones and recently released varieties are presented in Table 14.

Clone x N Rate x Spacing:

The three lines tested, NY103, NY109 and E11-45, produced similar total and marketable yields (Tables 15 & 16). The specific gravity of NY103 was significantly higher than the other two clones. There was no significant effect of spacing or sidedress nitrogen rate on the other parameters. Unfortunately E11-45 tubers had a considerable amount of hollow heart. Spacing and N rate did not have an influence on the incidence of this disorder.

Storage Results:

After-cooking darkening and blackspot ratings for clones grown in 1995 are given in Table 17.

Acknowledgments:

Seed was provided by R.L. Plaisted, Cornell University; K.G. Haynes, USDA; G.A. Porter, University of Maine; Childstock Farm, Malone, N.Y. The assistance of Bennett Orłowski, Rod Zeltmann, Mark Sisson, Sandra Mulvaney and Carole Brush is greatly appreciated.

Long Island Table 1. Tuber characteristics of potato clones grown on Long Island, N.Y.-1996.

CLONE	Table	Color	Texture	Shape	Depth	Eye Depth		Appearance	Comments
						Lateral	Apical		
Atlantic	4,5	Bu	N	R-O	MT	MS	MD	6	S Irr
BelRus	10,11	B	HR	L	SF	S	S	6	Allig
Century Russet	10,11	T	LR	L	SF	MS	S	7	S Irr, nice flesh
Chieftain	8,9	Pi	RS	O-R	MT	MS	MS	6	S Irr
Dark Red Norland	8,9	R-Pi	RS	R-O	MT	MS	M	6	variable color
Katahdin	4,5,6,7	W	RS	R-O	SF	S	MD	5.5	S Irr, pinkeye
Latona	12,13	W	RS	O	MT	MS	MS	3	Irr
Morning Gold	12,13	W	S	O	MT	MS	MD	3	Irr, L, pinkeye
Niska	4,5	W-Bu	RS	O	SF	MD	MD	5	Irr, pinkeye, Sc
Norwis	6,7,12,13	W	S	O	SF-F	MD-D	D	5	Irr
Onaway	2,3	W	S	O	MT-SF	MD	MD-D	4	Irr, L
Redsen	8,9,12,13	DR	S	R-O	R	S	S	7.5	nice color
Redstar	12,13	Pi	S	O	R	MS-S	MS	3	Irr, pinkeye, Sp
Russet Norkotah	10,11	B	MR	L	SF	MS-S	S	6	Irr, some BH
Snowden	4,5	Bu	N	R	MT	MD	MD-MS	5	Irr, Sc
Sunrise	2,3	W	SN	O-R	MT	MS	MS	6	S Irr
Superior	2,3,6,7	Bu	SN	O-R	SF	MD	MD	5	Irr
Symfonia	12,13	Pi	S	O	R	MS	MS	4	Irr, Sp, pinkeye
AF1331-2	2,3,4,5	W	RS-S	O	SF	MS-MD	MD-D	4	Irr, L
AF1424-7	2,3	W	S	R-O	R-O	MS	MS	5	Sc, Irr
AF1438-5	4,5	Bu	SN	R	MT	S	M	7	okay
AF1438-6	2,3	W	RS	R	R	MS	MS	5	GC
AF1455-9	4,5	Bu	RS	R	MT	S	MS-MD	7	small, S Irr
AF1565-12	2,3	W	RS	R-O	SF-MT	S	MS	5	Irr
AF1763-2	6,7	Bu	SN	O-R	SF	MS-D	MD	6	Irr, Sc, small
B0564-8	4,5	Bu	SN	R-O	MT	S	MS-MD	6	S Irr, DSE
B0564-9	4,5,6,7	Bu	SN	R	MT	MS	MS	6	SS, Irr
B0766-3	6,7	Bu	SN	R-O	MT	MS-MD	MD	5	Leak, Irr
B0811-13	8,9	DR	N	R-O	SF-MT	MD	MD	5	yellow flesh, S Irr
B0835-11	10,11	B	HR	L	SF-MT	S	S	6	Irr, rot
B0852-7	8,9	Pu	RS-S	R-O	R	S	S	7	okay, SS
B0856-4	6,7	W	RS	R-O	SF	S-MS	D	5	Irr, Sc
B0967-11	8,9	DPu	SN	O	MT	S	S	6	SS
B0972-10	6,7	W	S	O-R	MT	S	S	7	pink buds
B0984-1	8,9	MR-DR	SN	R-O	SF-MT	MD	MD	5	Irr, Sk
B1004-8	10,11	B	MR-HR	L	SF-MT	S	S	6	small, Sc, leak
B9922-11	10,11	B	HR	O-L	MT	S	S	6	Irr, BH
NY87	2,3,4,5	W	RS-SN	O	MT	MS-MD	MD	6	S Irr, Sc
NY99	4,5	W	S	O-L	MT	S	S	8	Bright, nice, L
NY102	4,5	W	RS	R-O	SF	MS-MD	MD	6	S Irr, IBH,
NY103	4,5,6,7	W	S-RS	O-R	MT	S	MS-S	7.5	nice, S Irr
NY108	6,7	Bu	N	R	R	S	MS	7	okay, but dark skin
NY109	6,7	W	S-RS	R-O	MT	S	MS-MD	7	L, bright
NY110	6,7	W	RS	O-R	SF	S	MD-D	6	S Irr
NY113	6,7	W	S	R	MT	MS	MD	7	blocky
NY114	6,7	Bu	SN	O-R	MT	S-MS	MD	7	S Irr
NY115	6,7	W	S	R-O	SF-MT	S	S-MS	8	Sc, S Irr
NY117	6,7	Bu	SN	R-O	SF	MS	D-VD	5	Irr, SS, squatty
W870	4,5	Bu	RS	R-O	SF	S	MS-MD	6	Irr, leak

COLOR: B=brown, Bu=buff, Pi=pink, Pu=purple, R=red, T=tan, W=white. Modifiers: L=light, M=medium, D=dark.

TEXTURE: N=netted, R=russet, S=smooth. Modifiers: H=heavy, M=moderate, R=Relatively, S=Slightly.

SHAPE: L=long, O=oblong, R=round. EYE DEPTH: D=deep, M=moderate, S=shallow. TUBER DEPTH: MT=medium

thick, R=round, F=flattened, SF=slightly flattened. COMMENTS: L=prominent lenticels, Irr=irregular, Kn=knobs,

Sc=scab, Sk=skinned, Sl=slightly, Sm=small, Sp=sprouts, St=stolons, SS=Silver scurf, F=flesh, Pi=pink, Y=Yellow, W=white.

Long Island Table 2. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity of early white-skinned clones grown at Riverhead, N.Y. - 1996.

Skillful Clones Grown at Riverhead, N. Y. - 1956.														
Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)						Size Distribution			Specific ¹ Gravity	
		2-4" cwt/A	percentage of standard	< 2"	2 to 2.5"	2.5 to 3.25"	4"	> 4"	2 to 4 in.	2.5 to 4 in.				
Season-114 days														
Superior	418	371	100	11	38	45	6	0		89	51	69		
Onaway	424	316	85	25	29	34	11	1		74	45	67		
Sunrise	380	340	92	10	27	47	16	0		90	63	68		
AF1331-2	404	277	75	31	23	34	12	0		69	46	70		
AF1424-7	407	346	93	15	38	40	7	0		85	47	75		
AF1438-6	427	344	93	18	21	43	17	1		81	60	63		
AF1565-12	355	278	75	22	44	30	4	0		78	34	64		
NY87	449	409	110	9	28	52	11	0		91	63	70		
Waller-Duncan														
LSD (0.05)	(58)	(61)										(2)		

Planted on 4/23/96, fertilizer rate was 100-200-200/A plus 60 lb N/A sidedressed, rotocut on 8/15/96, harvested on 8/20/96.

¹ -1.0 is excluded from specific gravity readings.

Long Island Table 3. Maturity, tuber shape, and internal and external defects of early white-skinned clones grown at Riverhead, N.Y. - 1996.

Clone	Maturity ¹		Tuber Data ¹		Tuber Defects (%)					Percentage		
	on	8/14/96	Shape	Appearance	Total	Sun- burn	Mis- shapen	Growth cracks	Other ²	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.
Season-114 days												
Superior	3		O-R	5	3	1	1	0	1	5	0	0
Onaway	6		O	4	19	4	10	2	2	3	0	0
Sunrise	6		O	6	4	2	1	0	0	0	3	0
AFI331-2	6		O	4	26	5	15	5	0	10	5	0
AFI424-7	4		R-O	5	5	1	1	0	3	10	0	0
AFI438-6	6		R	5	14	1	2	11	0	5	3	10
AFI565-12	4		R-O	5	8	3	4	1	1	0	3	0
NY87	6		O-R	6	4	3	1	0	1	18	3	0

¹ -See rating system outlined in the text.

² -Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade, primary defects listed in (). Mechanical defects, however, were not scored.

Long Island Table 4. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity of NE 107 white-skinned clones grown at Riverhead, N.Y. - 1996.

Clone	Season - 140 days												
	Total Yield cwt/A	Marketable Yield		Size Distribution (%)						Size Distribution			Specific ¹ Gravity
		2-4" cwt/A	percentage of standard	<2"	2 to 2.5"	2.5 to 3.25"	3.25 to 4"	> 4"	2 to 4 in.	4 in.	2.5 to 4 in.		
Katahdin	522	436	100	16	22	52	10	0	83	62	71		
Atlantic	484	441	101	9	25	60	6	0	91	66	87		
Niska	484	420	96	13	33	51	3	0	87	54	69		
Snowden	504	447	103	11	27	55	6	0	89	62	78		
AF1331-2	465	330	76	29	23	42	6	0	71	48	73		
AF1438-5	502	448	103	11	39	47	3	0	89	50	61		
AF1455-9	463	379	87	18	45	35	2	0	82	37	69		
B0564-8	441	376	86	15	38	43	4	0	85	47	74		
B0564-9	448	396	91	11	28	54	7	1	88	61	68		
NY87	511	459	105	10	23	57	9	0	90	67	70		
NY99	486	397	91	18	39	40	3	0	82	43	72		
NY102	390	326	75	16	41	40	3	0	84	43	77		
NY103	494	443	102	10	16	60	13	0	90	73	70		
W870	464	408	94	12	31	53	4	0	88	57	85		
Waller-Duncan													
LSD (0.05)	(36)	(36)									(3)		

Planted on 4/23/96, fertilizer rate was 100-200-200/A plus 60 lb N/A sidedressed, vine killed on 9/10/96, harvested on 10/1/96.

¹ -1.0 is excluded from specific gravity readings.

Long Island Table 5. Maturity, tuber shape, and internal and external defects of NE 107 white-skinned clones grown at Riverhead, N.Y. - 1996.

Clone	Maturity ¹ on 8/26/96	Tuber Data ¹		Tuber Defects (%)					Percentage				
		Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other ²	Hollow Brown Internal Necrosis				
									heart	center	Sl. Mod. Sev.		
Season - 140 days													
Katahdin	6	R - O	6	11	6	0	1	5	20	8	25	3	0
Atlantic	5	R - O	6	4	3	1	0	1	45	0	23	8	0
Niska	3	O	5	8	3	2	1	2	30	3	0	3	0
Snowden	5	R	5	7	2	1	1	3	13	0	15	0	0
AF1331-2	4	O	4	25	3	15	4	2	23	0	3	0	0
AF1438-5	3	R	7	2	1	1	0	0	3	0	35	3	0
AF1455-9	5	R	7	3	1	1	0	1	3	5	15	5	10
B0564-8	3	R - O	6	4	1	0	0	2	13	0	0	0	0
B0564-9	4	R	6	4	2	1	0	1	85	3	0	0	0
NY87	4	O	6	6	4	1	0	1	40	8	3	0	0
NY99	5	O - L	8	12	7	3	0	2	8	0	23	5	0
NY102	4	R - O	6	6	3	1	0	2	8	5	5	0	0
NY103	5	O - R	7	6	5	1	0	0	5	10	8	0	0
W870	4	R - O	6	5	2	2	0	1	5	0	0	0	0

¹ -See rating system outlined in the text.

² -Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade, primary defects listed in (). Mechanical defects, however, were not scored.

Long Island Table 6. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity of main-season white-skinned clones grown at Riverhead, N.Y. - 1996.

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)						Size Distribution			Specific ¹ Gravity
		2-4" cwt/A	percentage of standard	< 2"	2 to			> 4"	2 to 4 in.	2.5 to 4 in.			
					2.5"	3.25"	4"						
Season-140 days													
Katahdin	511	405	100	21	25	44	10	0	79	55	68		
Superior	472	422	104	11	37	48	4	0	89	52	72		
Norwis	510	434	107	12	12	47	26	3	85	73	69		
AF1763-2	459	354	87	23	45	31	1	0	77	32	61		
B0564-9	495	447	110	9	23	55	12	1	90	67	67		
B0766-3	525	463	114	11	18	57	14	1	88	71	73		
B0856-4	543	380	94	30	22	40	8	0	70	48	64		
B0972-10	356	309	76	13	46	40	1	0	87	41	64		
NY103	493	429	106	13	20	54	13	0	87	67	70		
NY108	396	354	88	8	14	52	24	2	90	76	72		
NY109	445	406	100	9	28	56	7	0	91	63	60		
NY110	516	469	116	9	22	58	11	0	91	69	71		
NY113	367	327	81	11	35	49	4	0	89	54	63		
NY114	490	446	110	8	25	58	8	1	91	66	70		
NY115	440	365	90	17	42	39	3	0	83	41	68		
NY117	484	441	109	9	25	58	9	0	91	67	77		
Waller-Duncan													
LSD (0.05)	(43)	(51)									(4)		

Planted on 4/23/96, fertilizer rate was 100-200-200/A plus 60 lb N/A sidedressed, vine killed on 9/10/96, harvested on 10/1/96.

¹ -1.0 is excluded from specific gravity readings.

Long Island Table 7. Maturity, tuber shape, and internal and external defects of main season white-skinned clones grown at Riverhead, N.Y. - 1996.

Clone	Maturity ¹		Tuber Data ¹		Tuber Defects (%)					Percentage		
	on	8/26/96	Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other ²	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.
Season-140 days												
Katahdin	6		R-O	5	15	10	1	1	4	25	0	13 0 0
Superior	2		O-R	6	4	1	2	0	2	15	5	3 0 0
Norwis	5		O	6	10	4	2	1	2	20	5	23 13 0
AF1763-2	3		O-R	6	6	1	3	1	1	0	0	0 0 0
B0564-9	3		R	7	3	2	0	0	1	78	0	5 0 0
B0766-3	5		R-O	5	8	2	2	0	4	53	0	0 0 0
B0856-4	3		R-O	5	24	2	1	1	20	0	0	0 0 0
B0972-10	2		O-R	7	3	1	1	0	1	3	0	20 5 0
NY103	4		O-R	8	8	4	1	0	4	3	0	10 0 0
NY108	4		R	7	6	3	1	1	1	3	5	5 0 0
NY109	2		O-R	7	5	3	0	0	2	0	0	5 0 0
NY110	5		O-R	6	4	2	2	0	0	0	0	0 0 0
NY113	2		R	7	2	1	0	0	1	0	0	0 0 0
NY114	4		O-R	7	3	2	1	0	0	5	0	0 0 0
NY115	3		O-R	8	6	2	1	0	3	0	0	3 3 0
NY117	2		R-O	5	3	2	1	1	0	0	0	0 0 0

¹ -See rating system outlined in the text.

² -Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade, primary defects listed in (). Mechanical defects, however, were not scored.

Long Island Table 8. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity of red-skinned clones grown at Riverhead, N.Y. - 1996.

Clones grown at Riverview, N. Y., 1950.													
Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)						Size Distribution			Specific ¹ Gravity
		2-4" cwt/A	percentage of standard	< 2"	2 to 2.5"	2.5 to 3.25"	3.25" 4"	> 4"	2 to 4 in.	2.5 to 4 in.			
Season-140 days													
Chieftain	528	483	100	9	27	61	4	0	91	65	67		
Dark Red Norland (ME)	352	312	65	12	43	44	1	0	88	45	57		
Dark Red Norland (NE)	366	318	66	13	57	30	0	0	87	30	57		
Redsen	361	309	64	14	49	35	1	0	86	36	62		
B0811-13	443	399	83	10	32	54	4	0	90	58	68		
B0852-7	366	330	68	10	36	49	5	0	90	54	70		
B0967-11	449	410	85	9	22	61	8	0	91	69	75		
B0984-1	457	420	87	8	13	54	24	0	92	78	76		
Waller-Duncan													
LSD (0.05)	(38)	(38)									(3)		

Planted on 4/23/96, fertilizer rate was 100-200-200/A plus 60 lb N/A sidedressed, vine killed on 9/10/96, harvested on 10/1/96.

¹ -1.0 is excluded from specific gravity readings.

Long Island Table 9. Maturity, tuber shape, and internal and external defects of red-skinned clones grown at Riverhead, N.Y. - 1996.

Clone	Maturity ¹ on 8/26/96	Tuber Data ¹		Tuber Defects (%)					Percentage		
		Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other ²	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.
Season-140 days											
Chieftain	3	O-R	6	4	1	0	3	1	8	13	3 0
Dark Red Norland (ME)	1	R-O	6	4	0	1	2	0	3	0	0 0
Dark Red Norland (NE)	2	R-O	6	1	0	1	0	0	0	0	0 0
Redsen	2	R-O	7	4	0	3	2	0	0	0	0 0
B0811-13	2	R-O	5	2	0	1	0	0	3	0	0 0
B0852-7	2	R-O	7	3	0	1	1	0	20	8	0 0
B0967-11	2	O	6	5	1	2	0	1	0	3	0 0
B0984-1	3	R-O	5	5	0	2	2	1	18	0	0 0

¹ -See rating system outlined in the text.² -Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade, primary defects listed in (). Mechanical defects, however, were not scored.

Long Island Table 10. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity of russet-skinned clones grown at Riverhead, N.Y. - 1996.

Clone	Total		Marketable Yield		Size Distribution (%)							Size Distribution			Specific Gravity
	Yield cwt/A	4-16 oz. cwt/A	percentage of standard	<4	4 to 8	8 to 12	12 to 16	>16 oz.	4 to 16 oz.	8 to 16 oz.	16 oz.				
Season-140 days															
BelRus	336	200	100	40	45	13	2	0	0	60	15	76			
Century Russet	611	444	222	24	37	24	11	3	3	73	35	84			
Russet Norkotah	375	251	125	31	35	19	13	2	2	67	32	70			
B0835-11	404	298	149	21	27	28	19	5	5	74	47	71			
B1004-8	480	291	145	39	46	13	1	1	1	61	15	81			
B9922-11	436	328	164	20	36	29	11	5	5	75	40	81			
Waller-Duncan															
LSD (0.05)	(59)	(56)										(3)			

Planted on 4/23/96, fertilizer rate was 100-200-200/A plus 60 lb N/A sidedressed, vine killed on 9/10/96, harvested on 10/1/96.

¹ -1.0 is excluded from specific gravity readings.

Long Island Table 11. Maturity, tuber shape, and internal and external defects of russet-skinned clones grown at Riverhead, N.Y. - 1996.

Clone	Maturity on 8/26/96	Tuber Data ¹		Tuber Defects (%)					Percentage					
		Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other ²	Hollow heart	Brown center	Internal Necrosis	Sl. Mod. Sev.		
Season-140 days														
BelRus	2	L	6	1	0	0	0	0	15	0	0	0	0	
Century Russet	6	L	7	11	4	5	0	2	13	3	0	0	0	
Russet Norkotah	3	L	6	11	3	3	0	5	50	0	0	0	0	
B0835-11	3	L	6	9	4	2	2	1	13	3	0	0	0	
B1004-8	5	L	7	13	1	0	1	10	28	0	3	3	3	
B9922-11	4	O-L	6	6	0	2	4	0	58	0	0	0	0	

¹ -See rating system outlined in the text.

² -Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade, primary defects listed in (). Mechanical defects, however, were not scored.

Long Island Table 12. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity of European white- and red-skinned varieties grown at Riverhead, N.Y. - 1996.

Clone	Season-139 days									
	Total		Marketable Yield		Size Distribution (%)					
	Yield	2-4"	percentage	2-4"	< 2"	2 to 2.5"	2.5 to 3.25"	3.25 to 4"	> 4"	Specific ¹
	cw/U	cw/U	of standard	of standard						Gravity
Season-139 days										
White										
Norwis	489	406	100	11	9	41	33	6	83	68
Latona	541	351	86	35	35	29	0	0	65	77
Morning Gold	448	312	77	30	34	33	2	0	70	66
<i>Waller-Duncan</i>										
LSD (0.05)	(NS)	(93)								(4)
Red										
Redsen	300	266	100	11	38	47	3	0	89	59
Redstar	362	189	71	48	38	15	0	0	52	79
Symfonia	414	288	108	31	42	28	0	0	69	74
<i>Waller-Duncan</i>										
LSD (0.05)	(65)	(37)								(6)

Planted on 4/24/96, fertilizer rate was 100-200-200/A plus 60 lb N/A sidedressed, vine killed on 9/10/96, harvested on 10/8/96.

¹ -1.0 is excluded from specific gravity readings.

Long Island Table 13. Maturity, tuber shape, and internal and external defects of European white- and red-skinned varieties grown at Riverhead, N.Y. - 1996.

Clone	Maturity ¹									
	Tuber Data ¹		Tuber Defects (%)				Percentage			
	on 9/08/96	Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other ²	Hollow heart	Internal Necrosis center Sl. Mod. Sev.
Season-139 days										
White										
Norwis	2	O	5	9	4	4	2	0	18	13 10 8 0
Latona	3	O	3	28	9	16	1	2	23	3 20 0 0
Morning Gold	2	O	3	24	2	11	3	8	50	3 0 0 0
Red										
Redsen	1	R	8	5	0	3	1	0	0	3 0 3
Redstar	2	O	3	30	2	24	2	2	0	5 15 0 0
Symfonia	1	O	4	23	2	17	3	1	30	0 15 3 0

¹ -See rating system outlined in the text.

² -Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade, primary defects listed in (). Mechanical defects, however, were not scored.

Long Island Table 14. Yield and quality of early selection lines and recently named varieties in a non-replicated observation trial 1996.

Clone	Yield (cwt/A)		% standard 2 to 4	Spec. ¹	Percentage							Color	Texture	Eye Depth		Appearance	Comments ²		
	Total	2-4"			Defects	Grav.	HH	BC	Internal Necrosis					Shape	Depth			Lateral	Apical
									SI	Mod	Sev								
Season - 140 days																			
White-skinned lines																			
Katahdin	393	307	100	18	64	0	0	0	0	0	0	W	S	R-O	SF	S	MD	7	PE,Sc,SED
Norwis	641	547	178	4	69	20	10	20	10	0	0	W	S	O	F	D	D	5	Irr
Norwis	629	474	154	12	71	20	0	0	10	0	0	W	S	O	SF	D	D	5	Irr
Norwis	634	530	172	4	74	0	0	30	10	0	0	W	S	O	F	D	D	5	Irr
Norwis	658	514	167	13	71	0	0	10	10	0	0	W	S	O	F	MD	D	5	Rg
Superior	516	454	148	6	69	10	0	10	0	0	0	BU	SN	O-R	SF	D	D	4	Irr, PE
Superior	524	433	141	11	71	0	0	0	0	0	0	BU	SN	O-R	SF	D	D	5	Mis
AF1726-9	577	497	162	7	72	30	0	0	0	0	0	BU	SN	O-R	MT	MS	MS	7	S Irr,rot
AF1773-1	927	838	273	6	69	0	0	10	30	20	0	BU	SN	O	MT	S	MS	7	
B1066-22	502	435	142	11	75	30	0	0	0	0	0	BU	RS	O	MT	S	MS	0	Pointed
B1066-73	643	481	157	21	76	60	0	0	0	0	0	W	RS	O	MT	S	MS	6	Irr
B1066-78	582	483	157	13	83	50	0	0	0	0	0	BU	RS	O-R	MT	S	MS	6	PE,S,Irr
B1066-97	563	479	156	12	63	10	10	20	0	0	0	W	RS	O	MT	S	S	5	pointed, Irr
B1067-23	551	489	159	7	91	0	0	10	0	0	0	W	S	R-O	MT	S	D	6	nice except DAE
B1067-25	507	449	146	2	84	0	0	20	0	0	0	W	S	O	SF	S	S	8	OK
B1075-26	443	360	117	5	61	0	0	20	0	0	0	W	S	O	SF	S	MS	8	Sc
B1083-51	583	497	162	12	74	10	0	0	0	0	0	W	S	O	SF	S	MD	7	S Irr, SED
B1150-5	593	532	173	1	57	0	0	0	10	0	0	W	S	O	MT	S	S	8	nice
B1206-10	506	403	131	14	73	10	0	10	0	0	0	BU	N	R-O	MT	MD	D	4	Irr, SED
B1213-7	584	533	174	3	67	0	0	20	0	0	0	BU	SN	O	MT	S	S	7	SS
B1293-3	492	430	140	9	69	20	0	40	0	0	0	BU	RS	O-R	MT	S	MS	8	L Pi Buds
B1320-23	691	591	192	6	83	0	0	0	0	0	0	BU	SN	O-R	MT	S	MS	5	Sk,Irr
B1407-8	655	584	190	6	92	10	10	50	0	0	0	BU	SN	R	MT	S	MS	7	
P5-2	294	241	78	17	74	10	0	0	0	0	0	W	S	O	MT	S	MS	7	
Q3-12	485	431	140	9	80	0	0	0	0	0	0	W	RS	R-O	MT	MS	MS	7	
Q38-1	362	339	110	1	79	0	10	10	0	0	0	BU	N	O	MT	S	MS	0	

Long Island Table 14 continued. Yield and quality of early selection lines and recently named varieties in a non-replicated observation trial 1996.

Clone	Yield (cwt/A)		% standard 2 to 4"	% Defects	Spec. ¹ Grav.	Percentage							Color	Texture	Shape	Eye Depth		Appearance	Comments ²				
	Total	2-4"				HH	BC	Internal Necrosis				Sl.				Mod	Sev			Lateral	Apical		
								SI	Mod	Sev	Depth											SF	MS
Red-skinned lines																							
Chieftain	555	500	100	6	70	30	0	20	10	0	Pi	S	O-R	SF	MS	MS	6	S Irr, Sk					
Red Pontiac	804	673	135	12	62	10	0	0	0	0	Pi	RS	O-R	MT	D	D	4	Irr					
Redsen	439	319	64	20	60	0	0	0	0	0	DR	S	R	R	S	S	8	Nice					
B0811-4	228	114	23	0	78	0	0	10	0	0	Pi	S	R	R	MD	MD	5	Yellow,S Irr					
B0985-1	303	259	52	8	59	0	0	0	0	0	DR	S	O-R	MT	S	MS	7	S Irr,int red Sk					
White-skinned lines with poor yield and/or appearance																							
AF1725-39		B0984-3		B1098-30		B1338-27		B1428-4			P63-2												
AF1753-12		B1065-64		B1208-24		B1344-18		P13-5			P64-3												
AF1758-7		B1065-65		B1214-7		B1358-19		P21-12			P73-1												
AF1764-6		B1066-23		B1216-3		B1360-15		P21-19			P73-2												
AF1766-2		B1066-37		B1240-12		B1364-15		P21-2			Q38-2												
AF1769-1		B1066-51		B1240-14		B1364-19		P21-20			Q47-1												
AF1774-14		B1067-16		B1255-14		B1366-14		P21-5			Q8-2												
AF1774-15		B1068-15		B1291-6		B1368-13		P21-9			Cherokee												
AF1774-2		B1068-49		B1303-14		B1414-2		P32-3															
AF1774-22		B1091-29		B1333-27		B1418-2		P63-1															

¹ -1.0 is excluded from specific gravity readings.² -See footnotes in Table 1.

Planted on 4/23/96, fertilizer rate was 100-200-200/A plus 60 lb N/A sidedressed, vine killed on 9/10/96, harvested on 10/7/96.

Long Island Table 15. The effect of N sidedress rate and spacing on yield and quality of NY 103, NY 109 and E11-45 grown at Riverhead, NY - 1996.

Clone	Sidedress (lb N/A)	Spacing (inches)	Yield (cwt/A)	Total		Marketable Yield		Size Distribution (%)							Spec. Grav.
				Yield (cwt/A)	2-4" (cwt/A)	< 2"	2 to 2.5"	2.5 to 3.25"	3.25 to 4"	> 4"	2 to 4 in.	2.5 to 4 in.			
Season-139 days															
NY 103	0	6	466		413	11	26	54	9	0	89	63	68		
NY 103	50	6	477		389	18	24	45	13	1	81	58	67		
NY 103	100	6	494		425	13	23	56	8	1	86	63	68		
NY 103	0	9	457		403	12	21	57	11	0	88	68	67		
NY 103	50	9	501		422	15	19	45	20	1	84	65	68		
NY 103	100	9	503		408	18	17	48	16	1	81	64	69		
NY 109	0	6	450		379	16	34	47	4	0	84	50	62		
NY 109	50	6	504		430	15	30	50	5	0	85	55	60		
NY 109	100	6	494		430	13	27	53	7	0	87	61	61		
NY 109	0	9	447		391	13	25	58	5	0	87	63	61		
NY 109	50	9	453		392	14	21	54	11	0	86	65	61		
NY 109	100	9	459		405	12	19	56	13	0	88	69	59		
E11-45	0	9	506		434	14	21	52	13	0	86	65	61		
E11-45	50	9	509		388	21	14	48	15	2	76	62	63		
E11-45	100	9	537		420	20	17	45	16	2	78	62	64		
E11-45	0	12	479		408	14	12	47	26	1	85	73	61		
E11-45	50	12	488		370	22	13	43	20	2	76	63	61		
E11-45	100	12	458		385	15	16	48	21	1	84	68	63		
Main effects															
Clone	NY 103		483		410								68		
	NY 109		468		404								61		
	E11-45		496		401								62		
Spacing	Close		472		398								63		
	Wide		489		409								63		
N Rate	0		468		405								63		
	50		489		398								63		
	100		491		412								64		

Planted on 4/24/96, fertilizer applied at a rate of 100-200-200 lb/A in bands at planting, sidedress nitrogen was applied on 6/11/96, vine killed on 9/10/96, harvested on 10/7/96.

¹ - 1.0 is excluded from specific gravity readings.

Long Island Table 16. Maturity, and internal and external defects of NY 103, NY 109, and E11-45 grown at Riverhead, N.Y. - 1996.

Clone	Sidedress Spacing (lb N/A) (inches)	Maturity ¹ on 8/30/96	Tuber Defects (%)					Percentage							
			Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other ²	Hollow		Internal Necrosis				
									heart	center	Brown	Brown	SI.	Mod.	Sev.
Season - 139 days															
NY 103	0	6	3	7	8	4	1	0	0	3	5	3	3	0	0
NY 103	50	6	3	7	12	4	0	0	0	7	15	0	8	0	5
NY 103	100	6	4	7	9	4	2	0	0	3	8	3	10	0	0
NY 103	0	9	2	7	8	3	2	0	0	4	8	0	3	0	0
NY 103	50	9	4	7	10	5	2	0	0	3	15	0	10	5	0
NY 103	100	9	3	7	13	7	0	1	0	5	8	3	3	0	0
NY 109	0	6	2	6	9	5	0	0	0	5	3	0	8	5	0
NY 109	50	6	2	6	10	4	0	0	0	6	0	0	0	3	0
NY 109	100	6	2	7	8	4	1	0	0	3	5	0	15	3	0
NY 109	0	9	2	7	9	6	1	0	0	2	3	0	13	8	0
NY 109	50	9	2	7	10	7	1	0	0	2	5	0	10	0	0
NY 109	100	9	3	7	8	4	1	0	0	3	5	0	15	3	0
E11-45	0	9	4	6	11	5	1	0	0	4	45	0	8	0	0
E11-45	50	9	5	6	17	11	1	0	0	5	20	3	8	0	0
E11-45	100	9	5	7	16	8	2	0	0	6	20	0	15	0	0
E11-45	0	12	3	7	10	8	1	0	0	2	33	3	13	3	0
E11-45	50	12	5	7	19	12	2	0	0	5	28	5	13	8	0
E11-45	100	12	5	6	11	7	1	0	0	3	10	3	25	8	0

¹ -See rating system outlined in the text.² -Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade, primary defects listed in (). Mechanical defects, however, were not scored.

Long Island Table 17. After-cooking darkening and blackspot ratings of clones grown in 1996.

White				Red				Russet			
NE107 White				1996 Tables 6-7				1996 Tables 8-9			
1996 Tables 4-5				Clone	BS	ACD		Clone	BS	ACD	
Katahdin	4.7	6.0		Katahdin	4.9	6.0		Chieftain	5.0	5.9	
Atlantic	4.3	6.0		Superior	4.5	5.8		Norland Dark Red (ME)	4.0	6.0	
Niska	4.9	6.0		Norwis	5.0	6.0		Norland Dark Red (NE)	4.6	6.0	
Snowden	5.0	5.9		AF1763-2	4.5	6.0		Redsen	4.0	6.0	
AF1331-2	5.0	5.9		B0564-9	5.0	5.9		B0811-13	4.9	5.9	
AF1438-5	5.0	5.9		B0766-3	4.7	5.8		B0852-7	4.9	6.0	
AF1455-9	3.9	5.9		B0856-4	4.9	6.0		B0967-11	5.0	6.0	
B0564-8	4.8	6.0		B0972-10	5.0	6.0		B0984-1	4.8	5.9	
B0564-9	4.9	5.9		NY103	4.4	6.0					
NY87	4.7	6.0		NY108	4.6	6.0					
NY99	3.2	5.9		NY109	4.7	6.0					
NY102	4.9	5.8		NY110	4.8	6.0					
NY103	4.5	5.9		NY113	4.2	6.0					
W870	4.8	5.9		NY114	4.7	6.0					
				NY115	4.5	6.0					
				NY117	4.8	5.8					

Fisher's Protected

LSD (0.05)	(0.5)	NS	(0.4)	(0.1)	(0.3)	NS	(0.3)	NS
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After-cooking darkening (ACD) rating based on a scale of 1 to 5; 1 = severe darkening, 5 = no after-cooking darkening. Five tubers rated per replication, four replications in each experiment. Tubers were peeled and dipped in a 0.5% solution of sodium bisulfite and cooked in an autoclave for 7 minutes and rated after 20 minutes. Blackspot (BS) determinations are based on approximately ten tubers per replication. Tubers were stored at 40° F and bruised between 1/27/97 and 2/4/97 and then stored at 55° F. Bruised areas were peeled and evaluated two days after impact. Each tuber received a blow in each of two locations about 1 to 2 cm from the stem end. The bruising was done by dropping a 175 gram weight a distance of 30 cm. The point of impact was marked by inking the base of the weight. Ratings are based on a scale of 1 to 6 with 1 = severe discoloration and 6 = no discoloration.

New York - Upstate
D.E. Halseth, W.L. Hymes
R.W. Porter, R.L. MacLaury

Program Scope:

Potato variety yield trials were conducted in four counties in upstate New York in 1996 in which a total of 28 named and 48 numbered clones were evaluated. Five replicated yield trials were conducted at the Thompson Vegetable Research Farm at Freeville in Tompkins County on a Howard gravelly loam soil. Grower trials were conducted on mineral soils near Arkport (Steuben County) and Gainesville (Wyoming County) and on muck soil near Savannah (Cayuga County). Trials at Freeville and Gainesville were irrigated, and all trials were grown using standard commercial cultural practices. As evaluation of potato lines with golden nematode (GN) resistance is of high priority, 29% of the named and 71% of the numbered entries in these trials have GN resistance. Marketable yield, tuber quality and appearance, maturity, storage life and chip processing potential are among the important characteristics which are evaluated.

Research Farm Results:

The medium maturity trial had two entries, ND2417-6 and NY116, with marketable yield above Superior. In this trial Mainechip had the highest specific gravity (1.096) and NY115 the best tuber appearance. NY101 was again this year the top yielder in the medium-late trial. Atlantic had the highest specific gravity (1.091) while Quaggy Joe was the lowest (1.065). NYE11-45 had the best tuber appearance while B0585-5 had excessive external defects. The late trial had twelve lines with marketable yields above Katahdin. NY112 had the highest marketable yield, B0178-34 had the highest specific gravity (1.089, one unit above Atlantic), and B0564-9 had severe hollow heart. In the red-skinned trial, only N38-4R had yield close to Chieftain, all other lines were significantly less. B0984-1 and Dark Red Norland had the highest (1.083) and lowest (1.063) specific gravity, respectively. All red lines were relatively free of external and internal defects. Redsen had the best dark red color, Nordonna had good red color, and all other lines were much lighter in skin color, except B0852-7 which was very dark blue/purple

skinned. In the russet/french fry trial, Century Russet, W1099Rus and B9922-11 were good yielding russets and NY99 an attractive and good yielding long white. Russet Burbank and Shepody had high percentages of misshapen tubers and Krantz had vascular discoloration problems. B9922-11 and W1099Rus had the highest (1.085) and lowest (1.070) specific gravity, respectively.

Grower County Trial Results:

Round red and white tablestock selections were grown in the Cayuga County muck soil trial. The round white clone NY101 again for the third season had the highest yields in this muck tablestock trial. NY84 and NYE11-45 were also excellent yielding whites. Andover had the highest (1.075) and NY109 the lowest (1.061) specific gravity for the white clones. Nordonna, B1522-1 and N38-4R were red-skinned lines with yield higher than Chieftain. Redsen had the best color, followed by Nordonna, and then all other red selections were lighter in color similar to Norland. B0811-4 had the highest (1.079) and B1522-5 the lowest (1.055) specific gravity of the red-skinned clones.

In the chip-processing variety trials in Steuben and Wyoming counties, NY116 and NYE11-45 were top yielders for those counties, respectively. NY103 and NY112 had high yields at both locations. NY111 had the lowest average tuber weight and NY116 had the highest average tuber count for both trials. B0178-34 had the highest specific gravity (1.102 in Steuben Co. and 1.094 in Wyoming Co.), with Pike and Snowden just one or two units lower in both of the chip-processing county trials.

Table Heading Explanations:

Marketable yield in cwt/a was calculated from total yield less: external defects; undersize tubers (smaller than 1 7/8 inches); and oversize tubers (over 4 inch diameter).

Percent marketable yield represents the percentage that each entry's marketable yield is of that of a specified standard variety in that trial.

Size distribution percentage is the weight of a specific size category divided by total yield (including defects).

Specific gravity was taken by potato hydrometer.

Vine maturity ratings were on a nine point scale:

- 1 = all plants completely dead
(very early maturity)
- 9 = all plants full green
(very late maturity)

Tuber shape was classified using the code:

- 1 = round
- 2 = mostly round
- 3 = round to oblong
- 4 = mostly oblong
- 5 = oblong
- 6 = oblong to long
- 7 = mostly long
- 8 = long
- 9 = cylindrical

Tuber appearance was subjectively evaluated using the scale:

- 1 = extremely rough or otherwise unattractive
- 9 = very uniform and attractive

External defects were rated on all material graded. Internal defects were made on a subset of tubers, usually 10 per replication, taken from size categories 3 and 4.

Acknowledgements:

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The Freeville crew is acknowledged for their excellent cooperation in maintaining the research farm plots.

Update New York Table 1. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the medium maturity trial grown at Freeville, New York - 1996.

Variety/Clone	Total Yield cwt/A	Mkt. Yield cwt/A	Yield % of std	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)		Mean Tuber #/ft wt(oz)	Spec. Grav.	
									1 7/8-4"	2 1/2-4"			
				1	2	3	4	5					
Andover	391	308	84	3	36	39	13	9	88	52	6.3	6.5	84
Atlantic	476	347	94	4	32	44	13	7	89	57	8.0	6.2	90
AF1425-1	365	285	77	6	46	41	5	1	92	46	7.5	5.1	71
AF1433-4	322	282	76	7	38	47	7	1	92	54	6.4	5.2	76
AF1565-12	381	307	83	6	39	39	11	5	89	50	7.0	5.6	74
Kennebec	447	218	59	3	20	41	27	10	88	68	6.7	6.9	78
MaineChip	379	330	89	4	47	43	5	1	96	48	7.6	5.2	96
Monona	349	286	78	4	30	45	16	5	91	61	5.8	6.2	71
ND2417-6	469	389	105	6	45	38	9	3	92	47	9.4	5.2	83
ND2471-8	407	325	88	5	45	42	8	0	95	50	8.2	5.2	87
NY102	415	360	97	8	64	26	2	0	92	28	9.5	4.5	87
NY103	452	355	96	4	35	46	13	1	95	59	8.2	5.8	75
NY109	435	367	99	4	31	51	11	4	93	62	7.4	6.1	66
NY113	366	305	83	4	30	47	14	5	91	61	6.4	6.0	69
NY114	386	286	78	3	24	45	16	13	85	61	5.8	7.0	79
NY115	377	311	84	5	28	43	18	6	89	61	6.3	6.3	80
NY116	416	370	100	6	59	32	2	0	94	35	9.5	4.5	80
Superior (std)	437	369	100	5	46	38	8	3	93	46	7.6	6.0	76
Waller-Duncan													
LSD (k=100)	99	64									0.7	1.2	3
C.V. (%)	(14)	(13)									(7)	(14)	(3)

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

Plant date: May 14

Vine-kill date: August 30

Harvest date: September 5

Upstate New York Table 2. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the medium maturity trial grown at Freeville, New York - 1996.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)				Int. Tuber Defects (%) ²		
		Shape	Appear.	Sun-		Mis- shapen	Cracks	Rot	Holl.	
				Total	green				Heart	Vasc. Disc.
Andover	2.4	2.0	7.3	8.8	4.3	1.3	3.1	0.1	0.0	0.0
Atlantic	6.0	1.0	6.0	16.2	11.4	1.5	2.5	0.8	2.5	7.5
AF1425-1	2.0	3.0	7.5	14.4	12.2	0.5	1.3	0.4	0.0	2.5
AF1433-4	2.3	2.0	5.4	4.9	2.6	2.0	0.4	0.0	0.0	20.0
AF1565-12	3.4	3.0	5.4	8.4	3.6	1.4	2.2	1.3	0.0	5.0
Kennebec	4.4	4.0	4.1	38.9	23.2	5.8	9.8	0.2	2.5	7.5
MaineChip	3.8	2.0	5.3	8.5	4.7	1.2	2.5	0.0	5.0	10.0
Monona	5.5	2.0	4.8	8.2	5.6	1.3	0.9	0.4	0.0	7.5
ND2417-6	5.1	2.0	6.9	8.7	4.5	2.5	1.6	0.1	0.0	5.0
ND2471-8	2.0	1.0	6.8	14.8	7.6	0.9	6.1	0.2	0.0	0.0
NY102	3.8	2.0	6.5	5.4	4.5	0.7	0.2	0.0	5.0	2.5
NY103	5.4	1.0	8.1	15.2	11.7	1.2	0.6	1.8	0.0	0.0
NY109	1.5	3.0	8.1	8.4	6.4	0.7	0.8	0.5	0.0	5.0
NY113	1.8	1.0	7.8	7.8	7.0	0.0	0.6	0.2	0.0	10.0
NY114	4.8	2.0	6.9	8.9	6.5	0.6	1.7	0.3	0.0	7.5
NY115	3.3	1.0	8.0	6.8	6.4	0.3	0.0	0.1	0.0	7.5
NY116	3.5	2.0	5.3	4.7	4.2	0.5	0.0	0.0	0.0	10.0
Superior (std)	2.0	3.0	5.0	7.5	3.9	2.0	1.6	0.0	2.5	5.0

¹See the standard NE107 rating system for a key to these ratings in the preceding discussion section.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 3. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the medium-late maturity trial grown at Freeville, New York - 1996.

Variety/Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)		Mean Tuber #/ft wt(oz)	Spec. Grav.
			1	2	3	4	5	1 7/8-4"	2 1/2-4"		
Atlantic AF1455-9	495 427	315 347	3 8	30 40	46 40	13 9	8 3	88 89	59 49	8.1 8.4	6.3 5.3
B0585-5 Genesee	397 368	141 285	2 7	17 38	40 43	24 12	17 1	81 92	64 54	5.6 6.9	7.3 5.5
Kanona Katahdin (std)	373 463	277 367	5 4	32 34	44 49	15 12	3 1	91 95	59 61	6.8 8.4	5.7 5.7
Monona Norwis	354 506	285 457	5 3	31 33	44 51	17 11	3 2	92 95	61 62	6.6 8.8	5.6 6.0
NY84 NY87	473 434	383 364	4 3	32 41	45 43	12 11	7 2	89 95	57 54	8.3 8.2	6.0 5.5
NY101 NY117	540 492	483 316	4 2	40 24	48 46	8 16	0 12	95 86	56 62	10.9 7.4	5.2 7.0
NYE11-45 Quaggy Joe St. Johns	441 492 439	381 333 320	7 4 4	50 37 32	38 40 46	5 14 13	0 4 5	93 91 91	43 55 59	9.6 9.3 7.9	4.8 5.5 5.8
Waller-Duncan LSD (k=100)	42	44								0.8	0.6
C.V. (%)	(7)	(10)								(7)	(8)
¹ Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"											

Plant date: May 14

Vine-kill date: September 3

Harvest date: September 9

Upstate New York Table 4. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the medium-late maturity trial grown at Freeville, New York - 1996.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²			
		Shape	Appear.	Total	Sun- green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.	
Atlantic AF1455-9	4.3	2.0	5.3	24.6	14.2	2.8	7.4	0.1	0.0	5.0	2.5	
	3.0	2.0	7.5	8.3	6.7	1.3	0.2	0.1	0.0	5.0	2.5	
B0585-5 Genesee	3.1	1.0	6.8	45.3	15.9	4.4	24.5	0.4	5.0	2.5	0.0	
	6.4	2.0	8.0	14.9	13.3	0.9	0.6	0.0	0.0	2.5	0.0	
Kanona Katahdin (std)	3.8	1.0	6.1	17.1	15.6	0.5	1.0	0.0	0.0	0.0	0.0	
	5.1	2.0	6.0	15.7	14.7	0.3	0.6	0.0	2.5	7.5	0.0	
Monona Norwis	4.0	2.0	5.0	10.7	7.6	1.6	1.0	0.6	0.0	0.0	0.0	
	4.6	2.0	6.0	4.6	3.8	0.4	0.5	0.0	0.0	2.5	5.0	
NY84 NY87	3.0	2.0	7.1	8.0	5.3	2.1	0.5	0.1	0.0	7.5	0.0	
	1.9	2.0	7.0	10.9	10.1	0.4	0.5	0.0	0.0	2.5	0.0	
NY101 NY117	3.4	1.0	7.3	5.8	4.5	0.5	0.6	0.2	0.0	2.5	0.0	
	3.0	3.0	6.9	21.5	15.7	1.7	3.9	0.1	0.0	5.0	0.0	
NYE11-45 Quaggy Joe St. Johns	5.1	2.0	8.1	6.4	5.2	1.2	0.0	0.0	0.0	0.0	0.0	
	2.5	2.0	7.0	23.7	19.7	2.2	0.9	0.9	0.0	0.0	2.5	
	4.8	3.0	6.5	18.0	15.0	1.5	1.6	0.0	0.0	10.0	0.0	

¹See the standard NE107 rating system for a key to these ratings in the preceding discussion section.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 5. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the late maturity trial grown at Freeville, New York - 1996.

Variety/Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)		Mean Tuber #/ft wt(oz)	Spec. Grav.
			1	2	3	4	5	1 7/8-4"	2 1/2-4"		
Allegany	409	275	3	28	45	17	7	90	63	6.5	75
Atlantic	479	339	4	31	49	12	4	92	61	8.5	88
B0178-34	426	316	5	38	42	12	3	92	54	8.3	89
B0564-8	407	345	6	41	42	10	1	93	52	8.5	75
B0564-9	382	321	6	33	47	10	4	91	58	7.5	75
B0856-4	457	220	2	14	39	23	22	75	61	5.8	69
B1029-6	359	312	4	38	44	11	4	92	54	13.7	85
Elba	452	306	3	22	48	15	12	86	63	6.9	81
Katahdin (std)	426	294	4	32	49	12	3	93	61	7.7	74
Lili 9"	548	397	10	56	30	4	0	90	34	14.2	79
Lili 14"	442	299	9	47	37	6	0	90	44	10.7	80
Matilda 9"	377	252	26	63	10	0	0	74	10	14.6	86
Matilda 14"	332	217	21	66	12	1	0	79	12	12.0	87
Monona	334	254	5	29	43	18	6	89	60	6.2	68
NY107	406	331	6	48	39	5	1	92	44	9.7	81
NY108	364	275	3	21	56	15	5	91	70	5.9	81
NY110	375	307	3	36	48	9	3	94	57	6.9	77
NY111	393	286	5	43	40	10	1	93	50	8.6	82
NY112	529	423	2	26	52	13	6	92	65	8.8	81
Pike	371	315	8	57	31	3	1	91	34	9.3	83
Snowden	430	344	4	51	35	8	2	94	43	9.0	89
Waller-Duncan											
LSD (k=100)	54	47								5.0	3
C.V. (%)	(10)	(11)								(35)	(3)

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

Plant date: May 15

Vine-kill date: September 11

Harvest date: September 25

Upstate New York Table 6. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the late maturity trial grown at Freeville, New York - 1996.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)				Int. Tuber Defects (%) ²			
		Shape	Appear.	Total	Sun- green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
Allegany	3.0	1.0	7.4	21.8	15.5	3.5	2.9	0.0	0.0	0.0	0.0
Atlantic	2.8	1.0	6.4	21.1	13.9	3.1	3.9	0.2	10.0	0.0	2.5
B0178-34	2.1	1.0	5.9	17.4	7.3	2.4	7.7	0.0	2.5	7.5	2.5
B0564-8	1.8	1.0	7.0	8.7	8.1	0.4	0.1	0.1	5.0	0.0	0.0
B0564-9	1.1	1.0	6.5	6.7	5.2	1.1	0.0	0.4	47.5	0.0	0.0
B0856-4	2.8	2.0	5.5	27.2	16.1	0.2	10.6	0.3	2.5	2.5	0.0
B1029-6	3.5	1.0	7.3	5.2	4.0	1.0	0.1	0.0	7.5	2.5	0.0
Elba	6.1	1.0	6.5	17.8	16.3	1.1	0.3	0.0	0.0	12.5	0.0
Katahdin (std)	3.4	1.0	6.4	24.0	22.3	1.3	0.4	0.0	0.0	2.5	2.5
Lili 9"	3.1	4.0	6.4	17.1	7.8	5.6	3.4	0.3	7.5	10.0	0.0
Lili 14"	3.0	5.0	6.5	22.6	8.3	8.8	5.4	0.1	2.5	10.0	0.0
Matilda 9"	2.8	4.0	6.5	7.1	5.0	1.8	0.3	0.0	0.0	2.5	10.0
Matilda 14"	2.9	3.0	5.3	14.3	10.9	3.4	0.0	0.0	0.0	7.5	0.0
Monona	1.9	1.0	5.1	12.5	9.1	2.5	0.3	0.7	0.0	7.5	2.5
NY107	1.8	2.0	7.8	10.6	8.3	1.4	0.3	0.5	0.0	7.5	0.0
NY108	2.6	1.0	7.1	15.9	9.1	3.5	3.3	0.0	0.0	0.0	0.0
NY110	1.3	1.0	6.9	12.0	9.9	2.0	0.1	0.0	0.0	0.0	0.0
NY111	3.4	1.0	5.1	20.4	19.6	0.8	0.0	0.0	0.0	5.0	2.5
NY112	4.0	3.0	7.4	11.8	9.6	0.5	1.7	0.0	10.0	2.5	0.0
Pike	4.1	1.0	6.3	6.4	5.2	0.8	0.3	0.1	0.0	2.5	0.0
Snowden	2.4	1.0	5.5	14.0	10.3	3.4	0.3	0.0	0.0	15.0	0.0

¹See the standard NE107 rating system for a key to these ratings in the preceding discussion section.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 7. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the red/purple-skinned variety trial grown at Freeville, New York - 1996.

Variety/Clone	Total Yield cwt/A	Mkt. Yield cwt/A	% of std	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)		Mean Tuber #/ft wt(oz)	Spec. Grav.
				1	2	3	4	5	1 7/8-4"	2 1/2-4"		
B0852-7	283	243	55	8	50	37	4	1	91	42	6.8	78
B0984-1	326	277	63	3	24	49	15	9	87	64	5.4	83
B0985-1	208	172	39	10	54	33	3	0	90	36	5.8	69
B1102-3	205	129	29	36	55	9	0	0	64	9	8.6	71
Chieftain (std)	466	443	100	3	33	52	11	1	96	63	8.5	68
Dark Red Norland	332	292	66	8	60	31	0	0	92	32	8.7	63
N38-1R	310	265	60	12	51	36	1	0	88	37	8.4	71
N38-4R	462	419	95	7	37	48	8	1	92	56	9.8	67
Nordonna	355	296	67	15	62	23	1	0	85	23	11.2	74
NY97	333	289	65	5	31	46	14	3	92	60	6.2	68
P49-19R	399	320	72	11	48	36	3	1	88	40	10.3	69
Redsen	331	257	58	12	49	36	2	1	88	38	8.9	67
Waller-Duncan												
LSD (k=100)	30	34									0.8	0.4
C.V. (%)	(7)	(9)									(7)	(7)

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

Plant date: May 20

Vine-kill date: September 11

Harvest date: September 20

Upstate New York Table 8. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the red/purple-skinned trial grown at Freeville, New York - 1996.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²		
		Shape	Appear.	Total	Sun- green	Mis- shapen	Growth Cracks	Rot	Holl.		Int.
									Heart	Vasc. Disc.	
B0852-7	1.0	1.0	7.8	5.6	0.7	3.0	1.6	0.3	0.0	0.0	2.5
B0984-1	1.3	2.0	5.9	2.4	0.0	2.2	0.1	0.0	0.0	5.0	0.0
B0985-1	1.0	1.0	7.3	6.6	0.0	2.8	3.8	0.0	0.0	7.5	0.0
B1102-3	1.0	2.0	5.7	0.8	0.1	0.8	0.0	0.0	0.0	3.3	0.0
Chieftain (std)	1.5	1.0	7.3	1.3	0.2	0.2	0.9	0.0	0.0	2.5	0.0
Dark Red Norland	1.0	1.0	5.5	3.7	0.1	0.7	2.9	0.0	0.0	0.0	0.0
N38-1R	1.1	1.0	6.3	3.0	0.0	0.6	2.3	0.1	0.0	0.0	0.0
N38-4R	2.4	3.0	7.4	1.6	0.3	0.9	0.3	0.1	0.0	0.0	0.0
Nordonna	1.6	2.0	6.9	1.5	0.2	0.9	0.2	0.2	0.0	2.5	0.0
NY97	1.1	3.0	7.0	4.7	0.5	3.9	0.2	0.0	0.0	2.5	0.0
P49-19R	2.4	1.0	7.9	7.8	0.5	5.4	1.9	0.0	0.0	5.0	0.0
Redsen	1.1	1.0	8.0	9.7	0.1	2.9	6.7	0.0	0.0	2.5	0.0

¹See the standard NE107 rating system for a key to these ratings in the preceding discussion section.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 9. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the russet/french fry trial grown at Freeville, New York - 1996.

Variety/Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)					Mean Tuber #/ft wt(oz)	Spec. Grav.
			1	2	3	4	5	4 to over		12 oz				
								12 oz	8 oz					
B9922-11 BelRus	372 333	269 235	9 28	46 51	28 16	9 4	8 1	74 68	45 21	17 5	6.0 7.5	6.5 4.6	85 80	
Century Russet Kennebec	429 398	331 248	15 7	53 32	23 31	7 20	2 9	75 64	32 61	9 29	7.9 5.8	5.7 7.1	83 77	
Krantz NY99	330 339	235 280	25 11	56 51	16 32	3 5	0 1	72 83	19 38	3 7	7.5 5.8	4.6 6.1	75 78	
Rus. Burbank (std) Russet Norkotah	390 315	219 196	15 34	43 49	27 15	10 2	4 0	71 64	42 17	14 2	6.7 8.3	6.0 4.0	81 72	
Shepody W1099RUS	343 376	223 280	10 20	47 59	29 16	9 4	5 2	76 75	42 21	13 5	5.8 8.0	6.2 4.9	82 70	
Waller-Duncan LSD (k=100)	30	40									0.9	0.6	3	
C.V. (%)	(6)	(11)									(9)	(8)	(3)	

¹Size classes: 1 = under 4 oz, 2 = 4 to 8 oz, 3 = 8 to 12 oz, 4 = 12 to 16 oz, 5 = over 16 oz

Plant date: May 20

Vine-kill date: September 11

Harvest date: October 1

Upstate New York Table 10. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the russet/french fry trial grown at Freeville, New York - 1996.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²		
		Shape	Appear.	Total	Sun- green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
B9922-11 BelRus	2.0	6.0	7.9	10.5	1.8	5.2	3.6	0.0	2.5	2.5	0.0
	1.6	6.0	7.8	1.2	0.1	1.1	0.1	0.0	7.5	0.0	0.0
Century Russet Kennebec	4.0	8.0	5.8	5.6	0.9	4.7	0.0	0.0	0.0	0.0	0.0
	1.1	4.0	4.9	21.7	10.6	9.3	1.3	0.5	2.5	5.0	0.0
Krantz NY99	1.0	7.0	5.0	4.0	0.4	2.1	1.4	0.0	0.0	12.5	0.0
	2.3	8.0	7.9	5.6	4.3	1.3	0.0	0.0	0.0	0.0	0.0
Rus. Burbank (std) Russet Norkotah	2.6	8.0	4.4	24.4	1.5	21.2	1.7	0.0	2.5	0.0	0.0
	1.0	7.0	7.3	4.6	1.0	3.4	0.0	0.2	0.0	2.5	0.0
Shepody W1099RUS	1.1	8.0	4.0	19.6	1.6	17.8	0.3	0.0	0.0	0.0	0.0
	1.4	7.0	6.5	4.4	1.7	2.4	0.3	0.0	0.0	0.0	0.0

¹See the standard NE107 rating system for a key to these ratings in the preceding discussion section.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 11a. Yield, marketable yield, grade size distribution, tuber number per foot and weight, external and internal defects, and specific gravity for white-skinned varieties grown on muck soil in Wayne County near Savannah, New York - 1996.

Variety or Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. ¹ (% of Tot. Yld.)			#/ft wt(oz)	Pct. External ² Tuber Defects			Pct. Internal ³ Tuber Defects			Spec. Grav.
			1	2	3		S	K	G	R	H	V	N
Andover	354	271	76	94	2	5.8	8	1	4	3	0	0	0
Genesee	382	299	84	92	2	8.1	10	0	1	2	0	0	0
Katahdin (std)	455	357	100	89	6	7.2	7	0	1	2	0	0	0
L235-4	494	334	94	87	5	8.3	4	2	12	2	0	5	0
Monona	363	305	85	92	2	6.4	3	1	0	2	5	0	0
NY84	513	439	123	94	2	8.1	4	3	0	1	0	0	0
NY87	429	313	88	89	2	7.8	9	3	1	3	0	0	0
NY99	417	284	80	84	0	9.3	12	0	0	3	0	0	0
NY101	594	493	138	92	0	10.8	6	0	0	4	0	0	0
NY103	329	257	72	91	0	7.0	8	0	1	4	0	0	0
NY109	415	354	99	94	0	7.6	9	0	0	0	0	0	0
NY115	343	269	75	86	5	6.5	5	0	1	2	0	0	0
NYE11-45	493	436	122	95	0	10.0	4	1	0	1	0	0	0
Superior	381	341	96	94	0	7.7	3	0	1	1	0	0	0
Waller-Duncan						3.4	2.8						5
LSD (k=100)	180	129				(16)	(15)						(3)
C.V. (%)	(16)	(16)											

¹Size categories: 1 = under 2", 2 = 2-4", 3 = over 4"

²S = Sun-green, K = Knobby/Misshapen, G = Growth Crack, R = Rot.

³H = Hollow Heart, V = Vascular Discoloration, N = Internal Necrosis. Based on a 10-tuber sample per plot.

NOTE: All the white-skinned varieties planted at this location were replicated twice.

Plant date: May 22

Harvest date: Nov. 6

Fertilizer: 680 lb/A 9.36-9.62-34.01-2.1Mg-1.76S-0.56Mn at planting; side-dressed 500 lb/A 22-0-20.

Vine-kill: 1 pt/A Diquat, two applications

Irrigation: None

Upstate New York Table 11b. Yield, marketable yield, grade size distribution, tuber number per foot and weight, external and internal defects, and specific gravity for red-skinned varieties grown on muck soil in Wayne County near Savannah, New York - 1996.

Variety or Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. ¹ (% of Tot. Yld.)			Mean Tuber #/ft. wt(oz)		Pct. External ² Tuber Defects				Pct. Internal ³ Tuber Defects				Spec. Grav.
			1	2	3			S	K	G	R	H	V	N		
B0811-4	184	71	21	62	38	0	8.6	2.2	0	0	0	0	0	0	0	79
B1521-1	346	237	70	26	74	0	11.1	3.2	6	0	0	0	0	0	0	58
B1522-1	529	451	134	11	89	0	12.6	4.4	0	4	0	0	0	0	0	66
B1522-2	411	339	100	11	86	2	9.5	4.5	2	0	0	1	0	0	0	65
B1522-5	223	136	40	26	62	12	6.3	3.7	1	0	0	0	0	0	0	55
B1523-4	422	317	94	5	81	13	11.2	3.9	6	0	0	0	0	0	0	70
B1529-2	393	273	81	21	79	0	9.2	4.5	7	2	0	0	15	15	0	60
Chieftain (std)	473	337	100	9	84	7	8.7	5.6	8	1	2	1	0	0	0	63
Dk. Red Norland	406	322	95	10	90	0	9.3	4.6	7	0	5	0	0	0	0	55
N38-1R	335	261	78	17	83	0	9.2	3.8	4	1	0	0	0	0	0	60
N38-4R	508	431	128	7	91	1	9.6	5.5	4	2	0	1	0	0	0	61
Nordonna	487	423	126	8	92	0	10.0	5.1	3	1	1	1	0	0	0	63
NY97	428	330	98	13	84	3	8.8	5.0	5	1	1	0	0	0	0	61
P49-19R	467	387	115	14	85	1	11.3	4.3	2	0	0	0	0	0	0	63
Redsen	298	197	58	26	73	1	9.0	3.5	5	0	0	2	0	0	0	62
Waller-Duncan							3.5	1.6								3
LSD (k=100)	104	97					(11)	(11)								(2)
C.V. (%)	(8)	(10)														

¹Size categories: 1 = under 2", 2 = 2-4", 3 = over 4"

²S = Sun-green, K = Knobby/Misshapen, G = Growth Crack, R = Rot.

³H = Hollow Heart, V = Vascular Discoloration, N = Internal Necrosis. Based on a 10-tuber sample per plot.

NOTE: All the red-skinned varieties planted at this location were replicated twice, except for the B--- clones which were unreplicated.

Plant date: May 22

Vine-kill dates: Sept. 20 and 27

Harvest date: Nov. 6

Fertilizer: 680 lb/A 9.36-9.62-34.01-2.1Mg-1.76S-0.56Mn at planting; side-dressed 500 lb/A 22-0-20.

Vine-kill: 1 pt/A Diquat, two applications
Irrigation: None

Upstate New York Table 12. Yield, marketable yield, grade size distribution, tuber number per foot and weight, external and internal defects, and specific gravity for the Steuben County mineral soil variety trial grown near Arkport, New York - 1996.

Variety or Clone	Total Yield		Size Distrib. ¹			Mean Tuber		Pct. External ²						Pct. Internal ³						Spec. Grav.
	Yield cwt/A	Mkt. Yield cwt/A	% of std.	1	2	3	#/ft	wt(oz)	S	K	G	R	H	V	N	Defects	Defects	Defects	Defects	
Allegany	301	216	144	4	79	17	5.2	6.4	2	5	0	0	0	0	0	0	0	0	0	86
Andover	262	170	113	5	72	23	4.4	6.6	1	4	2	0	15	0	0	0	0	0	0	95
Atlantic (std)	279	150	100	4	64	31	4.3	7.2	1	8	1	0	5	0	0	0	0	0	0	93
B0178-34	258	234	156	9	91	0	6.7	4.2	0	0	0	0	0	0	0	0	0	0	0	102
Kanona	340	219	146	2	69	29	4.6	8.2	2	1	0	0	0	0	0	0	0	0	0	87
Monona	217	158	105	4	75	21	4.0	6.0	1	1	0	0	0	0	0	0	0	0	0	83
NY87	360	288	192	4	82	14	7.0	5.7	2	0	0	0	5	0	0	0	0	0	0	86
NY103	349	312	208	7	92	2	8.3	4.6	1	0	0	0	0	0	0	0	0	0	0	86
NY107	329	272	181	8	86	5	8.1	4.5	1	0	3	0	0	0	0	0	0	0	0	96
NY109	300	268	179	5	91	4	6.4	5.2	1	0	0	0	0	0	0	0	0	0	0	82
NY111	260	227	151	12	88	0	7.5	3.8	1	0	0	0	0	0	5	0	0	0	0	93
NY112	393	309	206	3	80	17	6.7	6.5	1	0	0	0	5	0	0	0	0	0	0	95
NY114	276	210	140	3	78	19	4.5	6.8	1	0	0	0	0	0	0	0	0	0	0	91
NY115	263	203	135	4	78	18	4.6	6.4	0	0	0	0	0	0	0	0	0	0	0	92
NY116	368	316	210	7	86	7	9.1	4.5	0	0	0	0	5	0	0	0	0	0	0	90
NYE11-45	339	289	193	5	87	9	6.9	5.4	0	1	0	0	0	0	0	0	0	0	0	77
Pike	276	244	163	10	90	0	7.8	3.9	1	1	0	0	0	0	0	0	0	0	0	101
Snowden	343	305	203	6	90	5	7.6	5.0	0	1	0	0	0	0	0	0	0	0	0	100
Waller-Duncan																				
LSD (k=100)	89	48					1.3	1.3							3					
C.V. (%)	(12)	(10)					(10)	(11)							(2)					

¹Size categories: 1 = under 2", 2 = 2-4", 3 = over 4"

²S = Sun-green, K = Knobby/Misshapen, G = Growth Crack, R = Rot.

³H = Hollow Heart, V = Vascular Discoloration, N = Internal Necrosis. Based on a 10-tuber sample per plot.

NOTE: This trial had two replications.

Plant date: May 31

Vine-kill dates: Sept. 19, 24, 29

Fertilizer: 1400 lb/A 8-16-8 at planting; top-dressed 100 lb/A Ammonium Nitrate (34%).

Vine-kill: 1 pt/A Diquat, three applications

Irrigation: None

Harvest date: Oct. 3

Upstate New York Table 13. Yield, marketable yield, grade size distribution, tuber number per foot and weight, external and internal defects, and specific gravity for the Wyoming County mineral soil variety trial grown near Gainesville, New York - 1996.

Variety or Clone	Total Yield cwt/A	Mkt. Yield cwt/A	, % of std.	Size Distrib. ¹ (% of Tot. Yld.)			Mean Tuber #/ft wt(oz)	Pct. External ² Tuber Defects				Pct. Internal ³ Tuber Defects				Spec. Grav.
				1	2	3		S	K	G	R	H	V	N		
Andover	349	270	129	7	85	7	7.1	5.4	-	3	3	1	0	0	10	81
Atlantic (std)	391	210	100	6	73	21	7.0	6.2	-	12	6	0	5	0	0	91
B0178-34	486	385	183	6	93	1	9.3	5.7	-	1	13	1	0	0	0	94
Kanona	432	342	163	3	82	15	6.7	7.1	-	0	0	3	5	0	15	82
NY87	477	389	185	2	82	16	7.6	7.0	-	0	0	0	0	0	0	77
NY103	465	417	198	4	92	4	8.6	6.0	-	0	1	0	0	0	10	74
NY107	470	409	195	8	90	2	11.0	4.7	-	0	2	1	0	0	10	82
NY109	474	405	193	4	87	10	7.8	6.7	-	0	1	0	0	10	5	69
NY111	315	282	134	10	90	0	8.5	4.1	-	1	0	0	0	0	0	85
NY112	516	440	210	3	85	11	7.9	7.2	-	0	0	0	5	0	0	81
NY114	398	316	150	4	80	16	6.0	7.3	-	0	1	0	0	0	0	83
NY115	393	325	155	3	84	13	6.4	6.7	-	0	0	1	0	0	0	82
NY116	432	395	188	8	92	0	11.1	4.3	-	0	0	0	0	0	0	81
NYE11-45	533	480	229	6	91	3	10.8	5.4	-	0	0	0	0	0	0	71
Pike	415	365	174	9	90	1	10.3	4.4	-	1	1	1	0	0	10	92
Snowden	428	369	176	9	90	1	10.3	4.6	-	4	0	0	0	0	5	93
Waller-Duncan																
LSD (k=100)	62	74					1.2	0.7								4
C.V. (%)	(7)	(10)					(7)	(6)								(3)

¹Size categories: 1 = under 2", 2 = 2-4", 3 = over 4"

²S = Sun-green (not rated), K = Knobby/Misshapen, G = Growth Crack, R = Rot.

³H = Hollow Heart, V = Vascular Discoloration, N = Internal Necrosis. Based on a 10-tuber sample per plot.

NOTE: This trial had two replications.

Plant date: June 3

Vine-kill dates: Sept. 23 and 30

Fertilizer: 1300 lb/A 8-12-16-1.8Mg at planting. Side-dressed 15 gal/A 30-0-0.

Vine-kill: 1 pt/A Diquat, two applications

Harvest date: Oct. 8

Irrigation: Four times (min. 1" each)

NORTH DAKOTA POTATO BREEDING REPORT

Richard Novy¹, Bryce Farnsworth¹, and Mike Schwalbe¹ in collaboration with Nikolay Balbyshev¹, Neil Gudmestad², Edna Holm³, Jim Lorenzen¹, Roald Lund¹, Paul Orr³, Duane Preston⁴, Gary Secor², Joe Sowokinos⁵.

Crossing and Seedling Production

A total of 351 potato crosses were made in the greenhouse during the winter and spring of 1996. In the summer of 1996, 92,754 seedlings were produced -- a 14% increase over 1995 levels, and a 34% increase since 1994. This level of seedling production increases the likelihood of identifying superior future varieties, and was made possible through the support of the RRVPGA who funded the construction of additional screenhouses at NDSU.

1st Year Selections

The first year selection protocol was modified from previous years in that seedlings were grown and evaluated at two different sites. Approximately 57,000 red and white-skinned seedlings were grown at the Langdon Agricultural Experiment Station, and an additional 15,462 russet seedlings were grown and evaluated at the Horticulture Research Farm at Absaraka. The russet selections were moved to Absaraka (with its associated warmer soil temperature) to improve the expression of russetting on the tubers. Seedlings were planted on May 16th at Absaraka and on May 28th and 29th at Langdon. Evaluation and harvesting was conducted September 11-13 at Langdon and October 3-4 at Absaraka.

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Advanced Selections

Replicated plantings of 829 second year selections from the 1995 seedling crop were planted at Grand Forks and Absaraka. A total of one hundred and forty-five second-year selections were saved at harvest from both sites. Of the advanced material (>2 year material), 249 selections were planted and 137 were saved at harvest. Third year and older selections were planted at the Casselton Agronomy Seed Farm for clean seed stock production.

Cultivar and Selection Yield Trials

Potato variety trials were planted under dryland conditions at Grand Forks (Potato Research Farm) and at three irrigated sites. Two of the three irrigated sites were collaborative efforts with growers near Oakes and McCanna, ND, with the third site at the Carrington Research and Extension Center. Spacing, fertility, planting and harvest dates are listed in Table 1. The McCanna and Grand Forks State Trial, with a few entry differences, were replicates of one another. They consisted of standard and newly released varieties, and advanced NDSU, Idaho, and Texas selections. The replication allowed for the assessment of the potato selections and cultivars under both dryland and irrigated conditions. All trials consisted of four replications of 25 hills in a randomized block design, the one exception being the Carrington trial, where experimental plots consisted of 30 hills.

Grand Forks: Three trials were conducted under dryland conditions at the Potato Research Farm. These trials (State, secondary, and European) looked good up to July 19th when approximately 4" of rain fell, followed shortly thereafter by another 1.5" on July 21st. Flooding of the trials occurred with the impact being extremely low yields. Across the three trials the U.S. No. 1 yield in cwt/acre ranged from 13 to 94. The data from the trials has been summarized for this report (Tables 2, 3, and 4), but the merit of the entries cannot be effectively assessed due to the impact the flooding had on yields.

McCanna: Of the thirty-three entries at the McCanna site, the red-skinned selection ND3574-5R was the highest yielding with a U.S. No. 1 yield (cwt/acre) of 374, followed closely thereafter by Red Pontiac at 370 (Table 5). The size distribution between ND3574-5R and Red Pontiac was quite different however, with Red Pontiac having a much larger percentage of tubers in the >3" category (26% -vs- 1%). NorValley, released as a variety this year, was

the highest yielding white-skinned chipping variety at 359, with ND2470-27 and ND4778-2 following closely behind. NorValley significantly outyielded the standard chipping cultivars Snowden (294), Norchip (290), and Atlantic (279). The highest yielding russet in the trial was the Idaho selection A79180-10 at 276. A79180-10 also has high specific gravity (1.094) and was rated highly for french fry production (Table 9). ND4093-4Russ was the highest-yielding North Dakota russet selection at 264 cwt/acre--its low specific gravity most likely will preclude its use for processing, however. Relative to other entries, the percentage of culled tubers was high for ND3828-15, Norchip, T1229-2Russ, Shepody, AT84378-1Russ, and Russet Burbank. Of those entries with >3" tubers that could be examined for internal defects, ND2676-10, Russet Norkotah, and ND4093-4Russ had the highest proportion with hollow heart.

Oakes: Of the 40 entries evaluated, Red Pontiac was the highest yielding with a U.S. No. 1 yield of 468 cwt/acre, closely followed by Red LaSoda at 452 (Table 6). The highest yielding red selection in the trial was ND2225-1R at 417. NDA2031-2 was the highest yielding white selection at 447, closely followed by NorValley at 428. NDA2031-2 originated from a cross made in North Dakota, with evaluation and selection in Idaho. This clone also yields quite high in Idaho, and has cold-chipping properties. Idaho russet selections, A82119-3 and A8337-3 had the highest U.S. No. 1 yield among the russeted entries. They both have specific gravities at levels acceptable for processing, however, A8337-3 received low ratings in the 1995 French Fry Evaluation (Table 9). Hollow heart was high at Oakes and was thought to be the result of high soil moisture coupled with cool night temperatures during the 1996 growing season. The cull category consisting of tubers with growth cracks and/or secondary growth was low for most entries with the exception of ND3828-15 (16%) and ND3647-6 (12%). The majority of the cullage in these two selections could be attributed to tuber growth cracks.

Carrington: This trial was designed to evaluate the performance of European varieties for french fry production in North Dakota. The range of production among the European entries varied from a U.S. No. 1 yield of 189 (Agria) to 86 (Aziza) (Table 7). Yields were lower than expected for an irrigated site, and are thought to reflect the water management at the Carrington site. The irrigation system was center pivot which also encompassed other agronomic crops at the station that required less water than potato during the growing season. Thus, the irrigation shedule most likely was not optimized

for potato production. However, useful comparisons can be made among the European entries especially when compared to the check varieties, Russet Burbank and Shepody. Shepody had the highest yield of the entries with a U.S. No. 1 yield of 199. Yields of Agria (189), Premier(188), and Asterix (187) were not significantly different from Shepody. Morene and Lili, although not as high yielding as Shepody, did compare favorably with Russet Burbank. With the exception of Shepody, Agria, and Morene, the remaining entries had >20% of their tubers fall into the undersize class (< 2" in diameter), limiting their U.S. No. 1 yield. Hollow heart was found at significant levels in *Agria* and Russet Burbank tubers >3" in diameter.

Processing Trials:

Chipping: In the winter and spring of 1996, chipping tests were conducted on cultivars and selections grown in the 1995 trials. The samples were chipped directly from 43°F storage and after reconditioning at 65°F for two and four weeks. Agtron readings were then taken of chipped samples. The results are shown in Table 8. Only ND860-2 had acceptable chip color directly out of 43°F after 7 weeks of storage; the water-stress encountered at Grand Forks last year may account for the low Agtron readings. Those clones with acceptable chips after 9 weeks of storage and two weeks of reconditioning were Niska, NorValley, NDA2031-2, ND3647-6, and ND3914-4. ND2471-8, ND2676-10, and ND3647-6 gave acceptable chips following 11 weeks of storage and 4 weeks of reconditioning. Fifteen European varieties and advanced selections were also evaluated under the three storage and reconditioning treatments. None, however, had commercially acceptable chips following any of the three treatments.

French Fries: Samples were tested for french fry quality by the Food and Nutrition Department using a taste panel. Sensory characteristics evaluated were fry color, flavor and texture (Table 9). A79180-10 was the only entry to be rated "good" (i.e. >7.0 rating) in every category. This clone was also the highest yielding russet in the McCanna trial (Table 5). Idaho selection A81286-1 also had high marks across the three evaluation categories and it received the highest rating of any entry in the color category.

Baking, Boiling and Microwaving: Sixty entries from the 1995 Grand Forks site were evaluated for the following sensory characteristics in each of three cooking categories:

Boiling: Characteristics examined were color immediately and four hours after cooking, mealiness, and flavor.

Baking: Mealiness, color, and flavor were evaluated.

Microwaving: Mealiness, color, and flavor were evaluated.

The top 10 varieties and advanced selections based on the summation of scores across all three cooking categories were Shepody, AO8478-1, AND8673-1Russ, ND2470-27, Norking Russet, NDO1496-1, Goldrush, ND4027-4Russ, A84180-8, and N8-14.

Variety Releases and Promising Selections-- Summary for 1996

ND2417-6, a white chipper with cold-chipping properties and a low incidence of internal defects was named and released as NorValley in August of this year. NorValley produces well under both dryland and irrigated conditions. This year, NorValley was among the top yielding varieties in the McCanna and Oakes trials with U.S. No. 1 yields of 359 and 428 cwt/acre respectively. Other promising white-skinned selections are ND2471-8, ND2676-10 (currently entered in the North Central Regional Trial), and ND2470-27. ND2471-8 is a medium-yielding, white-skinned selection with cold-chipping properties, high specific gravity (mid 90's typically), and nice uniformity and tuber type. Weaknesses of ND2471-8 include blackspot and a high incidence of hollow heart under certain irrigated conditions. It will be considered for release as a variety in 1997.

ND2676-10 also has cold chipping properties and was entered in the North Central Regional Trial for the first time this year. It yielded well and produced tubers with nice type in the McCanna trial this year. In the past it had been noted for erratic yields that were thought to be due to poor quality seed. Higher quality seed has since been used with an associated better performance.

ND2470-27 yielded well at both Oakes and McCanna this year. It also has cold chipping properties and could also be used as tablestock with high sensory ratings for boiling, baking, and microwaving.

Among the red selections, ND3574-5R, ND3196-1R and ND2225-1R stand out. All three have a deeper red color than Red Norland from the field. ND3574-5R is a high yielding red with a U.S. No. yield similar to Red Pontiac at McCanna (374 cwt/acre). It does tend to have a short tuber dormancy, and thus may only be suitable for production in southern states unless sprout inhibitors are used.

ND3196-1R yields and has a maturity similar to Red Norland. It has very nice tuber type and a darker skin color than Red Norland. A potential weakness is susceptibility to PVY.

ND2225-1R yielded well at Oakes with a U.S. No. 1 yield of 417 cwt/acre. This past growing season was its second year in the North Central Regional Trial. Its main weaknesses are a tendency to develop russeted skin or "buckskin" under certain field conditions and a susceptibility to tuber early blight.

Promising russet selections are ND4093-4Russ and ND4027-4Russ. ND4093-4Russ significantly outyielded Russet Burbank at McCanna for U.S. No. 1 yield but yielded less than Russet Burbank at Oakes. It has a nice tuber type, but its low specific gravity may limit its use for processing. ND4027-4Russ, with favorable sensory ratings for boiling, baking, and microwaving, has a higher specific gravity than ND4093-4Russ and could be used as a dual-purpose russet. The breeding program also evaluated several russeted Idaho and Texas selections. Promising selections are A79180-10 (McCanna only) which had excellent french fry evaluation scores in 1995, and A82119-3 (Oakes only). A8337-3 also yielded well at Oakes, but had poor french fry evaluation scores in 1995. TX1229-2Russ is also worthy of further evaluation with a large percentage in the >2.5" class. It also had a high percentage of cull tubers, but comparably was no worse in this category than Shepody or Russet Burbank.

Germplasm Enhancement Update

A major objective of the NDSU program is the incorporation of resistance to the newer genotypes of *Phytophthora infestans*, such as the US-8 genotype that predominates in North Dakota. Crosses utilizing parents with genetic resistance were conducted this past winter and their progeny grown in the greenhouse this past summer. In collaboration with Drs. Gary Secor and Neil Gudmestad of the Plant Pathology Department at NDSU, these progeny will be screened for resistance this coming winter. Tubers of resistant individuals will then be planted in the spring of 1997 for evaluation of agronomic traits. An ongoing component of this late blight research is the identification of new sources of genetic resistance that can be incorporated into the breeding program. Tables 10 and 11 summarize the results of two field trials to evaluate the genetic resistance of material obtained from the USDA potato breeding program in Beltsville, MD as well as European varieties and advanced selections. In both screening trials, potato clones were identified that had substantially lower late blight necrosis than standard cultivars such as

Russet Burbank. Resistant material will be incorporated into our late blight crossing block this coming winter.

Some of the highest levels of genetic resistance to *Phytophthora infestans* has been observed in somatic hybrids of *Solanum bulbocastanum* and their progeny obtained from Dr. John Helgeson, University of Wisconsin-Madison. *Solanum bulbocastanum* also has been observed to have resistance to Verticillium wilt. Preliminary evaluation of this material at the Verticillium screening plot in Grand Forks and at trials in Wisconsin indicate this resistance is transmissible to the progeny of the *S. bulbocastanum* somatic hybrids. The NDSU program will be actively involved in screening the *S. bulbocastanum* progeny for resistance to both late blight and Verticillium wilt, as well as for acceptable agronomic traits.

Another component of the breeding program is breeding for resistance to Colorado potato beetle. ND2858-1 was identified by Drs. Jim Lorenzen and Nikolay Balbyshev as having a high level of resistance to Colorado potato beetle. This clone also was high yielding, but produced tubers with poor type. Further crossing of this clone with other cultivars and advanced selections has produced progeny that retain a high level of resistance to the Colorado potato beetle, but also have improved tuber type. These progeny populations have both white, russet and red individuals, some of which have exceptional skin color and resistance to skinning. This material is nearing the stage where resistant selections have the potential to be varieties.

Breeding for resistance to silver scurf is another component of the potato program. No resistance has been identified in cultivated potato, but resistance has been identified in the related potato species *S. albicans*, *S. demissum*, and *S. kurtzianum*. These species are currently being utilized in our breeding program as sources of resistance.

Table 1. Spacing, Fertilizer, Soil Type, Planting and Harvest Dates of the 1996 North Dakota Potato Variety Trials.

Location	Spacing		Fertilizer Applied	Soil Types	Planting Date	Harvest Date
	Row	Plant				
Carrington	38"	10"	159#N, 75#P, 85#K	Heimdal/Emrick, loam	5-15	9-18
Grand Forks	38"	12"	68-30-0 @ 187.5 #/A	Bearden clay loam	6-3	9-24
McCanna	38"	12"	46-0-0 (urea) @ 516#/A	Sandy loam	5-8	9-3
Oakes	38"	12"	100# N, 20# P	Hecla fine sandy loam	5-14	10-1

Note: The North Dakota advanced selections described in these trials can be distinguished as russet, red, or white-skinned by:

ND5555-5 = white

ND5555-5R = red

ND5555-5Russ = russet

Table 2. 1996 State Trial: Performance of Potato Varieties and Advanced Selections Under Non-Irrigated Conditions at Grand Forks, ND

Variety or Selection	U.S. #1 Yield (Cwt/Acre)	Total Yield (Cwt/Acre)	% U.S. #1 of Total Yield	Specific Gravity
Red Pontiac	68	90	76	1.073
ND4027-4Russ	68	88	77	1.091
I 426	60	82	73	1.084
ND2470-27	57	78	73	1.085
Snowden	56	71	79	1.093
ND01496-1	50	64	78	1.091
NorValley	48	77	62	1.084
Russet Norkotah	48	70	69	1.086
ND2471-8	47	73	64	1.092
A081775-3	45	62	73	1.088
ND2225-1R	44	70	63	1.072
ND2676-10	42	70	60	1.083
Atlantic	41	59	70	1.097
Norchip	41	73	56	1.084
Shepody	39	63	62	1.092
ND4093-4Russ	39	73	53	1.084
ND3196-1R	38	64	59	1.076
ND3574-5R	37	65	57	1.068
A79180-10	34	55	62	1.095
NorDonna	33	52	64	1.074
ND3647-6	31	61	51	1.090
ND3828-15	31	56	55	1.079
Goldrush	29	53	55	1.085
ND4778-2	29	44	66	1.083
A82622-52	28	55	51	1.099
ND3636-1	27	39	69	1.091
N8-14	23	47	49	1.078
Russet Burbank	19	51	37	1.084
ND860-2	18	43	42	1.086
ND3455-1Russ	18	32	56	1.082
ND2050-1R	17	31	55	1.078
Red Norland	16	36	44	1.072
A080432-1	13	32	41	1.087

Table 3. 1996 Secondary Trial: Performance of Potato Varieties and Advanced Selections Under Non-Irrigated Conditions at Grand Forks, ND

Variety or Selection	U.S. #1 Yield (Cwt/Acre)	Total Yield (Cwt/Acre)	% U.S. #1 of Total Yield	Specific Gravity
ND5084-3R	94	123	76	1.070
ND5104-2Russ	93	116	80	1.090
ND4219-14Russ	92	121	76	1.092
Russet Norkotah	91	116	78	1.088
ND4240-9Russ	84	109	77	1.095
NDT8-731-1R	79	104	76	1.071
ND5104-1Russ	76	86	88	1.084
Pike	76	84	91	1.098
ND4233-1Russ	70	96	73	1.093
AND8673-1Russ	70	94	75	1.091
ND02438-7R	67	79	85	1.082
Norchip	66	87	76	1.093
AT85404-8	62	81	77	1.093
Red Norland	60	87	69	1.073
ND4519-12	52	66	79	1.091
ND4621-5R	50	80	63	1.089
ND3630-17R	48	65	74	1.089
Andover	35	42	83	1.092

Table 4. European Varieties Under Non-Irrigated Conditions at Grand Forks, ND - 1996.

Variety or Selection	Company	Usage ¹	U.S. #1 Yield (cwt/A)	Total Yield (cwt/A)	% US #1 Yield	Specific Gravity
SW88109	Svalof Weibull	T,C	65	94	69	1.076
Symfonia	De Z.P.C.	T	56	78	72	1.093
Estima	Can AGRICO	T	55	82	67	1.086
SW88113	Svalof Weibull	T,F	54	81	67	1.087
Agria	Can AGRICO	F, FF	50	85	59	1.086
Bright	Can AGRICO	F	48	82	59	1.089
Hertha	Can AGRICO	C	42	67	63	1.096
Norchip	Check	C	40	66	61	1.086
Penta	Can AGRICO	T	39	80	49	1.080
Morning Gold	De Z.P.C.	T	37	59	63	1.089
Sante	Can AGRICO	T	34	67	51	1.089
Matilda	Svalof Weibull	T	33	56	59	1.099
Fianna	Can AGRICO	C,T	32	44	73	1.089
Redstar	De Z.P.C.	T	32	61	53	1.074
Shepody	Check	F,T	29	45	64	1.094
Red Norland	Check	T	28	57	49	1.073
SW91102	Svalof Weibull	C	18	37	49	1.102

¹ C = chipping; F = french fries; T = tablestock

Table 5. Performance of Potato Varieties and Advanced Selections Under Irrigated Conditions at McCanna, ND--1996

Variety/Selection	Yield (cwt/acre)		% U.S.	Tuber Categories as % of Total Yield			Specific Gravity	Internal Defects ^b		Maturity ^c	% Stand Establishment	Tuber Number per Hill
	U.S.# 1 ^a	Total		No. 1	Cullage	<2"	2-2.5"	2.5-3"	>3"			
ND3574-5R	374 a	414	90	90	3	7	33	56	1	1.067	0/4	8
Red Pontiac	370 a	408	91	91	5	4	10	55	26	1.072	1/63	5
NorValley	359 ab	410	88	88	2	11	33	53	2	1.086	0/5	14
ND2470-27	350 abc	389	90	90	4	7	26	60	4	1.085	2/7	9
ND4778-2	334 abcd	352	95	95	1	4	19	67	8	1.079	3/20	7
Red Norland	310 bcde	355	87	87	7	5	18	63	6	1.076	4/15	7
ND3196-1R	309 bcde	339	91	91	1	8	33	58	0	1.087	0/0	8
ND2676-10	296 cdef	325	91	91	1	8	40	51	1	1.084	2/2	10
Snowden	294 cdef	328	90	90	4	6	31	56	3	1.100	3/6	5
ND3828-15	292 cdef	362	82	82	13	6	25	49	8	1.080	5/19	5
Norchip	290 defg	367	79	79	10	11	38	41	1	1.088	0/2	8
Atlantic	279 defg	321	87	87	5	8	26	55	6	1.091	6/12	7
ND2050-1R	277 defg	298	93	93	0	7	29	62	2	1.079	0/5	7
1426	277 defg	325	85	85	2	13	23	57	5	1.082	1/12	8
A79180-10	276 defgh	308	90	90	4	6	28	57	4	1.094	1/6	8
Russet Norkotah	273 defgh	321	85	85	4	11	30	50	5	1.077	5/8	10
N8-14	270 efgh	313	86	86	3	11	49	36	1	1.087	0/1	9
Goldrush	265 efghi	290	91	91	2	7	32	54	5	1.079	2/6	5
ND4093-4Russ	264 efghi	308	86	86	2	12	43	38	5	1.075	8/9	6
NorDonna	260 efghij	293	89	89	2	9	36	53	0	1.078	0/0	9
ND2471-8	259 efghij	303	85	85	6	9	32	51	2	1.090	0/3	7
ND2225-1R	253 efghij	286	89	89	0	11	45	44	0	1.072	0/0	9
ND3636-1	252 efghij	311	81	81	1	18	50	30	0	1.083	0/0	13
T1229-2Russ	251 efghij	305	82	82	14	3	11	48	23	1.087	6/42	6
Shepody	250 efghij	337	74	74	16	10	37	35	2	1.090	2/4	5
NDQ1496-1	246 fghij	269	91	91	1	8	23	58	10	1.094	1/18	5
ND3647-6	241 fghij	309	78	78	0	22	58	21	0	1.087	0/0	9
ND860-2	236 fghij	279	84	84	2	14	41	42	1	1.088	0/1	10
TXAU657-27	229 ghij	259	88	88	1	11	35	50	3	1.079	3/6	7
ND4027-4Russ	214 hijk	268	80	80	2	18	52	27	0	1.093	1/1	5
AT84378-1Russ	205 ijk	258	81	81	14	5	21	51	9	1.084	3/10	4
Russet Burbank	199 jk	291	68	68	18	14	52	16	0	1.087	0/0	7
ND3455-1Russ	160 k	202	79	79	4	17	50	29	1	1.080	0/1	7

^aYield means with the same letter are not considered significantly different from one another based on Duncan's Multiple Range Test with an alpha value of 0.05.

^bInternal defects abbreviations: HH=hollow heart and VD=vascular discoloration; 2/6 indicates that 2 of 6 tubers (>3" in size) had internal defects (i.e., HH or VD).

^cMaturity scale: 1=very early; 2=early; 3=medium; 4=late; 5=very late.

Table 6. Performance of Potato Varieties and Advanced Selections Under Irrigated Conditions at Oakes, ND--1996

Variety/Selection	Yield (cwt/acre)		% U.S. No. 1	Tuber Categories as % of Total Yield				Specific Gravity	Hollow Heart
	U.S.#1	Total		Cullage	Undersize (<2")	<2.5"	>3.5"		
Red Pontiac	468	503	93	5	3	17	66	1.065	5.4
Red LaSoda	452	486	93	6	1	18	70	1.071	5
NDA2031-2	447	475	94	1	6	59	34	1.085	2.4
NorValley	428	474	90	3	8	38	49	1.084	1.4
ND2470-27	417	448	93	1	6	32	59	1.084	5.2
ND2225-1R	417	484	86	1	12	51	34	1.071	0.9
A82119-3	411	461	89	2	8	36	44	1.086	6.9
A8337-3	405	450	90	0	10	40	41	1.090	6.7
Atlantic	398	414	96	2	3	32	59	1.087	6.7
Goldrush	396	448	88	4	8	26	44	1.079	3.9
Itasca	395	438	90	1	10	70	19	1.087	0.8
NDO1496-1	392	413	95	0	5	30	59	1.087	5.4
Agria	389	484	80	2	18	50	29	1.085	9.4
Chipeta	383	433	88	5	7	25	51	1.083	7.2
Russet Burbank	382	484	79	5	17	48	28	1.087	9.4
ND3574-5R	372	387	96	1	4	37	58	1.065	0.8
Viking	367	407	90	8	2	22	65	1.074	0.4
A81473-2	366	402	91	1	8	39	46	1.083	5.7
A81286-1	356	391	91	2	6	32	40	1.083	1.7
ND3636-1	355	394	90	1	8	57	33	1.087	2
AO8478-1	350	451	78	3	19	47	28	1.087	2.8
D. Red Norland	347	389	89	4	6	53	36	1.072	1.4
NorDonna	347	377	92	1	8	40	51	1.070	0.2
Shepody	346	400	86	5	9	39	39	1.088	1.5
Snowden	345	367	94	0	5	47	47	1.091	5.4
ND2471-8	343	397	86	8	6	35	50	1.088	7.2
ND2676-10	341	374	91	1	7	54	37	1.091	3.6
Russet Norkotah	340	394	86	2	12	41	37	1.077	10.5

Table 6. Performance of Potato Varieties and Advanced Selections Under Irrigated Conditions at Oakes, ND--1996 - (Cont'd)											
Variety/Selection	Yield (cwt/acre)		% U.S.	Tuber Categories as % of Total Yield					Specific Gravity	Hollow Heart	
	U.S.#1	Total		No. 1	Cullage	Undersize (<2")	<2.5"	<3.5"			>3.5"
Norchip	319	350	91	2	7	59	32	0	1.086	0.2	
ND3196-1R	308	334	92	2	7	49	43	0	1.079	7.3	
A8390-3	303	329	92	2	6	28	47	17	1.081	10.9	
ND3828-15	297	368	81	16	3	23	53	5	1.079	2.6	
ND3647-6	293	366	80	12	7	49	30	1	1.084	5.7	
Mainechip	290	308	94	3	3	26	63	5	1.095	10.7	
ND4219-14Russ	278	312	89	1	10	39	43	8	1.077	5.4	
ND860-2	255	302	84	2	15	58	25	1	1.079	1.6	
Ranger Russet	254	330	77	5	17	53	21	3	1.094	0.9	
ND2050-1R	224	243	92	2	6	42	50	0	1.073	0	

Table 7. Performance of European French Fry Varieties and Check Cultivars Under Irrigated Conditions at Carrington, ND--1996											
Variety/Selection	Company	Yield (cwt/acre)		% U.S.	Tuber Categories as % of Total Yield				Specific Gravity	Internal Defects ^b	
		U.S. # 1 ^a	Total		Cullage	Undersize(<2")	2 - 2.5 "	2.5 - 3 "		HH	VD
Shepody	<i>check</i>	199 a	216	93	1	7	40	50	2	1.092	0/6
Agria	Can AGRICO	189 ab	218	86	1	13	44	38	4	1.092	4/6
Premier	Can AGRICO	188 ab	256	74	5	22	54	20	0	1.099	0/6
Asterix	De Z.P.C.	187 ab	247	76	0	24	63	12	0	1.101	0/6
Morene	Hettema	139 bc	161	87	0	13	51	35	0	1.093	0/6
Russet Burbank	<i>check</i>	136 bc	182	74	1	25	59	15	0	1.098	2/6
Lili	Svalof Weibull	135 bc	179	75	1	24	47	26	2	1.092	0/6
Disco	Can AGRICO	124 c	152	80	0	20	60	20	0	1.106	1/6
Felsina	Hettema	112 c	159	69	2	29	60	9	0	1.101	0/6
Aziza	Can AGRICO	86 c	132	64	0	36	53	10	0	1.091	0/6

^a Yield means with the same letter are not considered significantly different from one another based on Duncan's Multiple Range Test with an alpha value of 0.05.

^b Internal Defects abbreviations: HH = Hollow Heart and VD = Vascular Discoloration; 2/6 indicates that 2 of 6 tubers (> 3" in size) had internal defects (i.e., HH or VD)

Table 8. 1996 Chip Tests (Agtron) of Cultivars and Selections Grown in State Trial at Grand Forks, ND in 1995.

Variety or Selection	First Chipping: 43° Since Harvest ¹	Second Chipping: 65° for Two Weeks ²	Third Chipping: 65° for Four Weeks ³
--- Agtron Reading ⁴ ---			
Atlantic	34*	40	48
Goldrush	22	40	30
Niska	34*	56	52
Norchip	32	47	42
NorKing Russet	25*	36	42
Norqueen Russet	28	40	34
NorValley	47	58	50
Ranger	29*	43	33
Russet Burbank	24	38	40
Russet Norkotah	21*	34	34
Shepody	23	34	32
Snowden	30*	52	50
A81286-1	26	45	50
A8337-2	28	45	35
A84180-8	21	38	35
AND8673-1Russ	ND	32	40
A08478-1	26*	33	43
N8-14	52	53	48
NDA2031-2	50	55	52
ND01496-1	42	52	47
ND860-2	57	53	52
ND2470-27	45*	35	53
ND2471-8	38	53	56
ND2676-10	45*	42	56
ND3455-1Russ	22	28	32
ND3636-1	52	53	40
ND3647-6	ND	57	55
ND3828-15	42*	52	52
ND3914-4	47	55	48
ND4027-4Russ	25	40	33
ND4093-4Russ	ND	38	36

¹ Stored for 7 weeks

² Stored for 9 weeks

³ Stored for 11 weeks

⁴ Agtron 0 - 90

0 = black; 90 = white

55 = minimum acceptable color

*Not an average, only 1 sample done.

ND - No Data

Table 9. Average French Fry Evaluation Scores for 1995 Season.*

Cultivar or Selection	Color	Texture	Flavor
Russet Burbank	3.9	4.8	4.3
Russet Burbank Simplot as Source)	4.6	5.1	4.5
NorKing Russet	6.8	6.3	6.6
Norqueen Russet	4.7	4.6	4.8
Ranger	6.2	5.3	6.1
Shepody*	5.9	5.9	6.0
Viking	5.6	5.8	6.2
A080432-1	7.0	6.0	6.6
A081775-3	5.7	5.5	5.9
A79180-10	7.0	7.0	7.1
A81286-1	8.0	6.7	7.4
A82119-3	6.1	5.2	5.9
A8337-2	4.5	4.9	4.7
A8390-3	6.6	6.7	6.2
A84180-8	4.4	4.7	4.3
ND2667-9Russ	6.2	5.4	5.6
ND3455-1Russ	5.9	5.1	5.6
ND3455-10Russ	5.6	5.0	5.6
ND4027-4Russ	7.3	5.6	6.2
ND4093-4Russ	6.3	5.9	5.8
ND4219-14Russ	6.7	6.1	6.3
ND4233-1Russ	6.2	5.8	6.0
ND4426-2Russ	3.7	4.0	4.3
ND4863-6Russ	7.7	5.8	6.5
AND8673-1Russ	5.3	6.1	5.8

*All scores are based on 3 separate evaluations of each cultivar. Six panelists participated in each evaluation for a total of 18 individual evaluations. The only exceptions were Shepody for which there was only enough sample to do 2 evaluations (i.e., a total of 12 individual evaluations), and the Russet Burbank control/reference samples for which there were 110 (Russet Burbank) and 60 (Simplot Russet Burbank) individual evaluations, respectively.

Rating Guide

7-9 Good
5-6 Fair, but acceptable
1-4 Poor, not acceptable

Table 10. Late Blight Reaction of Varieties and Selections from the USDA Potato Breeding Program*Gary A. Secor, Plant Pathology, NDSU, Fargo, ND 58105*

Plot planted: June 3, 1996
 Location: Prosper, ND (20 MW of Fargo)
 P. infestans: US8 (A2)
 Plot design: RCBD, 3 reps, 5 hills/selection/rep
 Soil: clay loam
 Plot not irrigated
 200#/a 20-20-12 at planting; no fungicides; Thiodan/Admire for CPB control
 Weather data attached

Cultivar/Selection	LB rating ¹					
	7/30	8/9	8/17	8/24	8/30	9/6
Libertas	0	2	18	17	28	38
A84118-3	0	1	19	26	28	32
Elba	1	2	22	43	35	48
B0767-2 ²	0	1	7	9	20	25
B0718-3	0	0	6	17	27	32
B0692-4	0	0	3	10	22	28
Bertita	0	1	20	26	32	35
A080432	0	1	23	35	35	37
AWn86514-2	0	1	7	10	25	28
A084275-3	0	1	15	20	35	35
Bzura	0	1	16	20	29	32
Greta	0	1	8	16	32	35
Stobrawa	0	2	17	22	36	50
C0083008-1	0	2	32	42	52	65
B0749-2F	0	1	28	32	43	52
Krantz	1	3	40	43	53	64
Pimperial	0	1	25	25	30	33
RB Border	--	--	38	60	75	84

¹avg 3 reps; percent necrotic tissue²heavy foliage and flowers last rating

Table 11. Late Blight Reaction of European Varieties and Advanced Selections, NDSU. Gary Secor, Neil Gudmestad and Richard Novy.

Plot planted June 3, 1996. Location: Prosper, ND. *P. infestans*: US8 (A2)

Plot design: RCBD, 2 reps, 5 hills/rep

Percent necrotic tissue

Cultivar/selection	Reading Date				
	8/9	8/17	8/24	8/30	9/6
1. Ofelia	2	20	38	68	58
2. Penta	< 1	23	40	50	68
3. Disco	1	25	45	53	68
4. Asterix	3	25	48	53	63
5. Morning Gold	1	35	50	65	80
6. Lili	6	23	35	45	48
7. Herta	1	30	40	55	70
8. Synfonia	< 1	30	45	68	83
9. Matilda	1	33	38	58	70
10. Aziza	< 1	23	35	45	48
11. AND-92186-1 Russ	1	40	53	68	83
12. Bright	3	38	53	63	80
13. W1100R	4	48	85	95	100
14. Rosamunda	< 1	14	28	47	68
15. Felsina	5	43	50	68	78
16. Agria	1	25	35	43	50
17. Fianna	0	23	40	45	68
18. Estima	1	40	58	75	80
19. Morene	1	38	35	55	60
20. Premiere	1	43	55	75	98
21. Sante	1	9	30	45	60
22. A79180-10	1	30	45	65	75
23. A81473-2	1	38	63	85	96
24. SW 88109	1	40	53	65	78
25. SW 91102	1	23	38	45	68
26. FL1533	1	50	78	83	96
27. FL1908	3	55	73	85	88

OHIO

Richard Hassell, David M. Kelly, E.C. Wittmeyer and John Elliott

NE-107 Project

Thirty-seven varieties and clones from the NE-107 Regional project were evaluated in replicated field trials located at the Ohio Agricultural Research and Development Center, Wooster, Ohio (Tables 1-3).

Methods

The seed samples when received from the NE-107 project nursery were stored under recommended temperature and humidity conditions. A randomized complete block design with four replications was used.

The soil type is a well-drained Wooster silt loam with a pH of 6.2, a phosphorus level of 132 lbs/A and a potassium level of 190 lbs/A, according to the analytical procedures of the Research and Extension Analytical Laboratory at the Ohio Agricultural Research and Development Center.

Fertilization consisted of 600 lbs/A of 10-20-20 disced in prior to planting and 600 lbs/A 10-20-20 sidedressed at planting.

Following harvest on September 25, samples for chip quality evaluation were taken to the Pilot Plant, The Ohio State University, Columbus, Ohio, where the samples were held at ambient temperatures until early October (approximately 20 days) when chipping and specific gravity determinations were made. In addition, other samples were graded for market quality. Ten tubers were taken at random from each replicate for hollow heart and internal necrosis ratings (see Table 2).

Rainfall during the growing season

(May-September) was 20.1 inches, 2 inches above the long-term average for Wooster.

The weather conditions immediately after planting for trial at Wooster may not reflect the true growing and yielding characteristics of the cultivars/selections.

Observational Trials

Seventy-one entries from various parts of the country were evaluated in a replicated field trial located at the Ohio Agricultural Research and Development Center, Wooster, Ohio (Tables 4-5).

Methods

The seed samples when received were stored under recommended temperatures and humidity conditions. A randomized complete block design with at least two replications of each entry. Soil type was a well-drained Wooster silt loam with a pH of 6.2 and phosphorus level of 132 lbs/A and potassium level of 190 lbs/A according to the analytical procedures of the Research and Extension Analytical Laboratory at the Ohio Agricultural Research and Development Center. Fertilization consisted of 600 lbs/A of 10-20-20 disced in prior to planting and 600 lbs/A 10-20-20 sidedressed at planting.

Following harvest on September 25, samples for chip quality evaluation on those that we felt might have potential for Ohio, were taken to the pilot plant at The Ohio State University, Columbus, OH. Samples were held at ambient temperatures until early October (approximately 20 days) when chipping and specific gravity determinations were made. In addition, other samples were graded for market quality. Ten tubers were taken at random from each replicate and checked for hollow heart and internal necrosis ratings.

Ohio Table 1. Yield, marketable yield, percent of yield by grade size distribution and specific gravity for varieties grown at Wooster, Ohio - 1996.

Cultivar	Total Yield cwt/A	Size Distribution by Classes					Specific gravity
		Marketable Yield		% of Total Yield			
		U.S.#1 cwt/A	% STD	U.S.#1 (>1-7/8")	B size	Culls	
Katahdin(std)	458	339	100	74	8	18	1.068
AF1424-7	340	279	82	82	10	8	1.072
Dark Red Norland	435	346	102	79	11	9	1.060
Atlantic	404	288	85	71	7	22	1.082
B0257-12	481	344	101	72	8	21	1.082
AF1565-12	389	280	83	72	8	20	1.072
B0178-34	397	250	74	63	6	31	1.078
AF1480-5	476	280	83	59	6	40	1.075
NY98	381	247	73	65	9	27	1.062
NY97	379	227	67	60	8	33	1.077
NY102	305	231	68	76	7	17	1.079
NY99	327	258	76	79	5	16	1.074
Cherry Red	366	274	81	75	8	17	1.070
Maine Chip	398	316	93	79	6	14	1.083
Snowden	516	425	125	82	7	11	1.080
St. Johns	413	222	65	54	5	41	1.080
AF1425-1	361	233	69	64	8	28	1.075
Yukon Gold	389	256	75	66	7	27	1.075
Conestoga	305	238	70	78	7	15	1.068
AF1426-1	398	186	55	47	5	48	1.074
AF1438-5	452	361	106	80	13	8	1.064
AF1475-16	361	253	75	70	5	25	1.078
AF1433-4	309	220	65	71	11	18	1.080
AF1470-18	391	237	70	60	6	34	1.061
AF1438-6	385	262	77	68	6	26	1.065
BO493-8	437	257	76	59	8	33	1.074
BO613-2	403	289	85	72	7	22	1.071
BO564-8	341	244	72	72	12	16	1.070
BO564-9	342	284	84	81	8	11	1.076
Kennebec	443	236	69	53	7	40	1.074
Superior	398	324	96	82	6	9	1.064
AF875-15	423	334	98	79	5	16	1.081
B9922-11	337	234	69	51	5	26	1.080
NY103	367	312	92	92	6	9	1.072
ND1871-3R	382	308	91	71	12	7	1.066
ND2471-8	411	325	96	81	7	14	1.079
ND2417-6	446	338	100	70	9	15	1.074

Ohio Table 2. Tuber shape and appearance, hollow heart ratings, internal necrosis ratings and chip color for varieties grown at Wooster, Ohio - 1996.

Cultivar	Plant maturity	Tuber shape	Appearance ^z	Hollow heart (%)	Internal necrosis (%)	Chip ^y color
Katahdin(std)	7	3	5	0	7	1.5
AF1424-7	7	3	7	3	0	1
Dark Red Norland	2	3	5	0	3	1
Atlantic	6	3	5	10	0	1
B0257-12	8	3	5	0	0	1.5
AF1565-12	5	2	6	0	0	1
B0178-34	8	3	4	3	0	1
AF1480-5	8	4	3	3	0	1.5
NY98	8	3	4	0	7	2
NY97	8	5	3	0	0	1
NY102	8	3	5	13	3	1.5
NY99	8	5	4	0	3	1
Cherry Red	6	3	5	30	0	1
Maine Chip	7	3	5	2	0	1
Snowden	9	2	4	13	3	1
St. Johns	7	3	4	0	0	1
AF1425-1	7	3	6	10	0	1
Yukon Gold	6	2	6	13	0	2
Conestoga	1	3	4	0	3	1.5
AF1426-1	8	3	4	0	0	1
AF1438-5	7	2	5	0	17	1
AF1475-16	7	3	4	0	0	1
AF1433-4	8	2	4	0	0	1
AF1470-18	7	2	5	0	0	1
AF1438-6	7	3	5	0	13	1.5
BO493-8	8	5	3	0	0	2
BO613-2	8	2	4	13	0	1
BO564-8	8	2	4	3	0	1
BO564-9	8	2	4	27	0	1.5
Kennebec	9	4	4	0	0	1.5
Superior	2	3	3	0	0	1
AF875-15	8	3	3	0	0	1
B9922-11	8	5	3	20	0	1
NY103	7	2	8	0	0	1
ND1871-3R	6	2	4	0	0	1.5
ND2471-8	7	3	5	7	0	1
ND2417-6	7	2	6	0	0	1

^zSee standard NE107 rating system

^yPC/SFA standard

Ohio Table 3. Plant stand, percent blister, Agtron readings, and additional tuber data for varieties grown at Wooster, Ohio - 1996.

Cultivar	Stand %	Plant Blister % ^z	Tuber Data ^y		
			skin texture	eye depth	skin color
Katahdin(std)	83	10	7.00	6.33	6.00
AF1424-7	76	60	5.67	7.00	7.00
Dark Red Norland	91	10	5.00	4.67	2.00
Atlantic	79	30	5.33	5.00	5.00
B0257-12	85	40	6.00	5.00	7.00
AF1565-12	88	50	6.33	5.00	6.33
B0178-34	90	0	6.00	7.00	6.00
AF1480-5	75	40	6.00	4.00	6.33
NY98	59	100	6.33	5.00	6.00
NY97	48	20	6.00	6.67	2.00
NY102	60	70	6.67	6.33	7.33
NY99	46	50	6.33	8.00	7.00
Cherry Red	82	50	5.00	5.67	2.00
Maine Chip	88	60	5.67	4.67	7.00
Snowden	88	30	4.00	5.00	7.00
St. Johns	68	20	7.00	5.33	7.00
AF1425-1	68	80	7.00	7.00	7.00
Yukon Gold	76	60	6.00	6.00	7.00
Conestoga	78	20	7.00	5.33	7.00
AF1426-1	80	50	7.00	5.00	7.00
AF1438-5	89	40	5.00	5.33	6.00
AF1475-16	66	30	8.00	7.00	7.00
AF1433-4	77	70	6.33	5.67	5.00
AF1470-18	82	10	6.33	6.00	5.67
AF1438-6	55	30	6.00	6.00	6.00
BO493-8	65	10	6.00	5.00	7.00
BO613-2	75	30	5.00	4.67	5.00
BO564-8	79	50	5.00	5.00	5.00
BO564-9	85	60	4.00	5.00	4.00
Kennebec	73	10	7.33	5.67	7.00
Superior	90	50	4.00	3.00	5.33
AF875-15	83	20	6.00	5.00	7.00
B9922-11	66	30	2.00	7.00	4.00
NY103	58	10	7.00	7.67	7.00
ND1871-3R	78	60	7.00	4.00	2.00
ND2471-8	84	30	7.00	5.33	7.00
ND2417-6	83	20	7.00	5.67	7.00

^zPercentage of chips that develop blisters greater than 20 mm in diameter during the frying process.

^ySee standard NE107 rating system

Cultivar	% Plant stand	Total yield cwt/A	U.S. No. 1 cwt/A	U.S. No. 1 %	B's %	Culls %	Internal Defects		
							Hollow heart %	Necrosis %	Vascular discoloration %
P73-1	38	83	76	91	5	19	1	0	0
P21-2	43	207	189	91	6	17	0	0	0
P21-12	77	261	256	98	2	3	0	0	0
P21-19	47	293	286	98	4	3	0	0	0
P73-2	38	242	220	91	13	11	0	0	1
P21-20	42	156	146	94	5	10	1	0	1
P63-1	33	127	119	94	6	9	3	0	1
Q47-1	48	197	192	98	4	2	0	3	0
P13-5	93	353	339	96	5	5	0	0	0
P13-1	85	345	337	98	12	3	0	0	0
Q38-1	80	153	148	95	6	3	1	0	0
P63-2	68	204	185	91	10	14	0	0	0
Q3-12	22	89	0	0	0	0	0	0	0
P32-3	45	154	146	95	4	9	0	0	0
Q8-2	82	331	325	98	3	1	0	0	0
P64-3	70	340	302	89	5	23	4	0	0
P5-2	78	262	251	96	3	7	1	0	0
P21-9	78	255	246	96	3	6	0	1	0
Q38-2	47	181	175	97	4	4	0	0	0
P21-5	82	276	262	95	7	6	0	0	0
AF1559-1	80	282	267	95	6	8	0	0	0
AF1156-14	73	237	193	82	2	44	1	0	0
AF1703-3	72	244	216	89	10	19	1	0	0
AF1685-5	68	292	260	89	13	15	0	0	0
AF1615-1	78	301	273	91	6	17	0	0	0
AF1701-3	62	313	247	79	11	42	0	0	0
BO856-4	72	266	229	86	6	29	0	2	0
BO915-3	68	244	203	83	5	38	1	0	0
B9922-11	85	223	2-5	92	4	16	4	0	0
BO564-8	92	266	252	95	11	2	0	0	0
BO564-9	83	208	197	95	7	6	1	0	0
BO835-11	67	260	244	94	8	8	1	0	0
CO85026-4	58	156	141	91	6	18	0	0	0
CO82142-4	45	167	155	93	6	13	3	0	0
CO81082-1	65	191	180	94	6	9	0	0	0
NY101	55	241	223	93	6	13	0	0	0
NY117	63	251	245	98	1	5	0	0	0
NY87	83	252	232	92	4	5	2	0	0
NY112	78	234	220	94	4	13	0	0	0
Superior BT	82	324	192	59	5	36	0	0	0
Superior	77	241	125	52	38	10	0	0	0
S-3	22	87	55	63	4	33	0	0	0
CZ82054-5	40	153	95	63	3	34	0	0	0
Estuma	33	179	83	46	9	45	0	0	1
Island Sunshine	83	221	188	85	13	2	0	0	0
Agri	32	206	161	78	9	13	3	0	0
Primiere	13	82	37	45	8	47	0	0	0
Sante	22	138	98	71	6	23	0	1	1
Penta	53	245	173	71	12	17	0	0	0
German Butterbal	62	264	180	68	18	14	0	3	2
All Red	28	167	120	72	7	21	0	0	0
NDC4069-4	18	87	67	77	6	17	0	0	0
All Blue	27	188	136	72	21	7	0	0	0
Cualin Alto	13	96	50	52	32	16	0	0	0
French Fingerling	37	156	91	59	30	11	0	0	0
Desiree	62	208	134	65	8	28	0	3	0
Bintje	62	321	147	46	18	36	0	0	0
H-90-3-3	45	99	77	77	8	15	2	0	0
H-100	42	170	115	68	11	21	0	0	0
H-200	12	67	36	54	12	34	0	0	0
H-914612	33	162	138	85	3	12	1	0	0
H-300	72	387	217	56	14	30	0	0	0
H-310	47	111	106	95	1	3	1	0	0
H-504A	17	122	94	77	6	17	0	0	0
H-414	62	228	179	79	15	6	0	0	0
H-1320	0	8	0			0	0	0	0
H-425	72	223	192	86	6	8	0	0	0
H-474Y	63	266	213	80	7	14	1	0	0
H-455	55	254	210	83	4	14	0	2	0
H-487	43	207	161	78	9	13	1	0	1
H-400	45	342	232	68	11	22	2	0	0

OhioTable 5. Tuber and chip data for selections in Observation trials, Wooster, Ohio - 1996.

Cultivar	Tuber color	Skin texture	Tuber shape	Eye depth	Appearance	Specific gravity	Chip color	Blisters
P73-1	7	7	3	7	3	--	--	--
P21-2	6	5	2	4	4	1.071	1	10
P21-12	7	6	2	6	4	1.079	2	40
P21-19	5	4	2	6	6	1.076	1	0
P73-2	7	7	3	6	3	1.086	1	40
P21-20	6	6	2	6	4	1.076	1	60
P63-1	6	6	2	6	3	1.085	1	10
Q47-1	6	5	3	4	4	1.075	1	10
P13-5	6	6	2	7	4	1.072	1	20
P13-1	7	6	3	6	4	1.075	1	20
Q38-1	5	5	2	7	5	1.079	2	0
P63-2	6	6	2	7	4	1.081	1	30
Q3-12	6	6	3	6	5	1.075	1	0
P32-3	6	6	2	7	3	1.083	1	30
Q8-2	5	5	2	7	6	1.082	1.5	40
P64-3	7	7	2	7	4	1.079	2	10
P5-2	7	7	3	7	5	1.081	1	10
P21-9	5	5	2	6	4	1.076	1.2	40
Q38-2	5	5	3	7	4	1.084	2	10
P21-5	7	7	2	6	5	1.077	1	30
AF1559-1	7	7	3	6	3	1.082	1	10
AF1156-14	4	2	6	6	4	--	--	--
AF1703-3	5	4	5	8	6	--	--	--
AF1685-5	7	6	3	7	4	--	--	--
AF1615-1	6	6	2	6	3	1.082	1	20
AF1701-3	5	3	5	5	4	--	--	--
BO856-4	7	6	2	5	4	1.072	1	10
BO915-3	4	2	5	6	3	1.082	3	20
B9922-11	4	2	4	7	3	1.082	1	30
BO564-8	5	5	2	6	5	1.081	1	30
BO564-9	5	6	2	6	6	1.076	1	20
BO835-11	5	4	3	6	4	--	--	--
CO85026-4	4	2	5	7	5	1.082	1	20
CO82142-4	4	4	4	7	5	--	--	--
CO81082-1	4	3	4	7	4	--	--	--
NY101	5	6	2	7	4	1.070	2	30
NY117	6	6	2	5	4	1.082	1	30
NY87	7	6	3	5	5	1.073	1.5	60
NY112	4	2	3	5	5	1.078	1	10
Superior BT	6	5	4	4	2	1.074	1.5	40
Superior	6	6	2	5	5	1.070	1	30
S-3	6	7	3	5	1	--	--	--
CA82054-5	5	6	2	6	1	--	--	--
Estima	6	7	3	7	2	--	--	--
Island Sunshine	6	6	2	6	6	1.071	2.5	40
Agri	5	6	3	7	2	--	--	--
Primiere	7	7	3	6	1	--	--	--
Sante	7	6	3	7	1	1.068	2.5	0
Penta	7	6	3	7	1	--	--	--
German Butterbal	5	6	3	6	2	--	--	--
All Red	2	7	3	7	1	--	--	--
NDC4069-4	1	7	3	7	1	--	--	--
All Blue	1	6	4	5	2	--	--	--
Cualin Alto	7	7	4	5	1	--	--	--
French Fingerling	2	7	7	5	2	--	--	--
Desiree	2	5	3	5	1	--	--	--
Bintje	7	7	3	5	1	--	--	--
H-90-3-3	6	5	2	5	3	--	--	--
H-100	5	4	2	7	2	--	--	--
H-200	5	4	3	5	3	--	--	--
H-914612	4	4	3	7	4	1.076	2	40
H-300	6	6	2	6	1	--	--	--
H-310	7	6	2	7	2	--	--	--
H-504A	5	5	4	7	2	--	--	--
H-414	6	6	3	7	3	1.076	2	30
H-1320	-	-	-	-	4	--	--	--
H-425	7	6	2	7	4	1.080	1	30
H-474Y	6	6	3	6	2	1.071	1	10
H-455	7	6	3	6	2	1.081	3	10
H-487	5	5	3	6	3	--	--	--
H-400	7	8	2	7	5	--	--	--

Oregon

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Introduction

Trials described herein include: (1) a statewide comparison of 24 entries at Powell Butte, Ontario, Klamath Falls and Hermiston; (2) chipping trial at Corvallis in the Willamette Valley; and (3) a late blight screening trial at Corvallis.

All crops were grown using spacing, fertilization, irrigation, pest control and other inputs common to the producing areas. Extreme weather patterns (monthly frost and hot temperatures) in the Klamath Basin may have accounted for excessive internal problems. No unusual problems were observed in the other locations.

Oregon Statewide Trial

Twenty-four entries were compared in four locations throughout Oregon (Table 1.)

AO85165-1, an Oregon selection from the USDA/ARS breeding program in Idaho, appeared to be the most promising fresh market entry. Total and US No. 1 yields were far superior to those of Russet Norkotah; however, AO85165-1 was susceptible to hollow heart, and tubers tended to be somewhat round. Hollow heart in AO85165-1 was more severe than previous trials indicate, and possibly due to adverse weather conditions in the Klamath Basin. Closer seed spacing may be needed to keep AO85165-1 tuber size optimum as it tends to get too big. Despite these faults, AO85165-1 shows potential and may be released by Oregon in the near future.

AO87277-6 produced excellent yields and solids, but tubers were often slightly pointed. AO87277-6 fried lighter than Russet Burbank. AO89128-4 also yielded well and produced high solids. This selection produced the best fry color in the trial and internal defects were minimal. Both of these selections show considerable promise and will be entered into the Western Regional Potato Variety Trial in 1998.

Other entries worthy of mention include: AO88103-3 and AO91522-4. Both had good yields, high grade out and acceptable fry color. AO90319-1 was kept

for further evaluation as a possible "gourmet" variety because it has yellow flesh.

AO91812-1 and AO91812-2 (both chipping selections) produced excellent yields, high grade out and good fry color compared to Atlantic. AO91812-1 did show a tendency to develop folded bud ends and still had attached stolons at harvest suggesting late maturity.

As noted under "comments" in Table 1., most early generation selections in this trial are discarded for any of several reasons.

Chip Trial

Several entries performed well at Corvallis (Tables 2-5). NDA2031-2 appeared to be the most promising. It produced high yields and exceptionally good color in all fry tests (Tables 4-5). NDA2031-2 fry color from 40 degrees was better than Chipeta out of 50 degrees. NDA2031-2 internal quality was far superior to Atlantic and Snowden. A87109-10 also produced high US #1 yields and acceptable fry color.

Several Frito-Lay entries performed well. FL-1867 and FL-1831 both produced acceptable yields and good color in all fry tests. FL-1867 produced a high percentage of US #1's but seemed susceptible to hollow heart. FL-1831 also produced a high percentage of US #1's, and good internal quality; however, tubers were flat with folded bud ends.

Other entries showing good potential include: BCO894-2, AC87313-3, and Chipeta. Unlike previous years, Chipeta had good internal quality. Chipeta produced high yields and acceptable fry color at 50 degrees but chips were extremely dark from 40° F.

Late Blight Screening Trial

Fourteen entries (7 varieties and 7 selections) were grown without fungicides at Corvallis (Table 6).

Foliage of all entries, except FL-1625, was virtually dead by September 20, 1996. Vast differences in tuber infection were observed at harvest. AO84275-3, A84118-3, A82360-7, and COO83008-1 showed minimal tuber infection while Russet Norkotah, Ranger Russet, Shepody, and Chipeta were the most susceptible. AO84275-3 and A84118-3 have been discarded from the Tri-State and Western Regional trials due to several weaknesses; however, these selections will likely be utilized as future breeding parents.

Oregon Table 1. Average Performance of 24 Potato Clones at Four Oregon Locations¹

Entry	Yield (cwt/a)		US No. 1		oz/ tuber	L/W ²	Spec.		Fry	Percent ⁴				Comments
	Total	No. 1	Rank	%			Grav.	Color ³		HH	BC	BS	IBS	
Russet Burbank	486	313	21	64	6.56	1.92	1.078	30.6	4	9	4	0	0	Irregular shape, knobs, poor
Ranger Russet	489	391	11	80	7.69	1.96	1.083	37.1	0	1	4	1	1	Long, skinny, some rhizoc.
Shepody	513	400	10	78	9.13	1.71	1.077	31.9	2	1	4	0	0	Big, rough, knobs
Russet Norkotah	401	312	22	78	6.84	1.80	1.066	31.0	1	2	1	0	0	Nice, fairly smooth
Atlantic	499	375	13	75	6.62	1.06	1.086	44.0	22	5	6	0	0	Fair, some rhizoc., scab
AO82611-7	551	435	6	79	7.15	1.89	1.082	36.7	1	0	9	0	0	Pointed, knobs, rough
COO83008-1	437	358	16	82	8.50	1.66	1.081	40.0	3	9	7	2	2	Nice, slightly coarse, some growth cracks
AO85165-1	530	461	4	87	8.82	1.66	1.075	30.8	17	1	4	0	0	Big, slightly coarse
AO87119-3	482	344	17	71	7.36	1.93	1.065	29.0	0	0	2	0	0	Discard
AO87277-6	501	420	9	84	7.23	1.90	1.085	38.7	5	0	3	0	0	Nice, some pointed
AO89128-4	495	374	14	76	5.31	1.93	1.089	47.3	4	0	2	0	0	Pointed, Fair
COO90071-1	543	426	8	78	5.96	1.69	1.081	29.6	2	0	5	0	0	Discard
AO90014-1	457	358	15	78	6.64	2.12	1.083	45.1	1	0	0	1	1	Discard
AO90017-4	487	332	18	68	5.49	1.96	1.084	39.7	0	2	5	5	5	Discard
AO90045-13	567	517	1	91	11.44	1.71	1.078	36.7	4	6	10	0	0	Discard
AO90088-1	488	381	12	78	6.59	1.67	1.091	42.4	4	0	6	0	0	Discard
AO90319-1	429	326	19	76	5.94	1.82	1.075	31.0	1	0	4	0	0	Dark russet skin, yellow flesh
AO88102-6	430	286	24	66	5.16	2.13	1.094	46.4	1	0	8	0	0	Discard
AO88103-3	530	433	7	82	7.09	1.65	1.081	39.9	21	0	4	0	0	Very Nice, slightly short
AO88162-2	444	316	20	71	5.52	1.96	1.080	34.1	3	0	0	2	2	Discard
AO91004-6	463	309	23	67	4.64	1.56	1.095	41.0	14	1	1	0	0	Discard
AO91522-4	581	495	2	85	7.85	1.85	1.075	39.4	0	3	3	0	0	Very Nice, some pointed
AO91812-1	575	471	3	82	6.84	1.00	1.083	46.7	2	0	4	1	1	Chipper, nice, folded bud ends
AO91812-2	567	451	5	79	5.79	1.06	1.085	46.8	1	0	3	0	0	Chipper, attached stolons

¹ Average values for 4-replicate trials at Hermiston, Klamath Falls, Ontario, and Powell Butte² Length divided by width³ Reflectance readings, high numbers signify light french fry color⁴ HH=Hollow Heart; BC=Brown Center; BS=Blackspot Bruise; IBS=Internal Brown Spot

Oregon Table 2. Yield, grade, and size distribution of 18 chipping varieties and selections at Corvallis, OR. 1996.

Variety/Selection	Yield (cwt/a)		Yield U.S. No. 1's (cwt/a)			Yield (cwt/a)			% U.S. No. 1's	oz/tuber ¹
	Total		Total	4-12 oz	> 12 oz	< 4 oz	2's & Culls			
AC83306-1	496.9	395.1	228.8	166.3		31.8	70.0	79.7		7.4
Atlantic	387.6	318.6	221.2	97.4		28.9	40.2	82.2		6.7
A88431-1	481.4	372.1	264.8	107.3		43.3	66.0	77.1		6.3
FL-1833	466.8	400.1	266.2	133.9		28.6	38.2	85.4		6.7
CO87106-5	428.3	338.3	300.5	37.8		59.3	30.8	78.8		5.1
BCO894-2	515.7	389.3	304.2	85.1		56.0	70.4	75.6		6.1
FL-1867	424.8	370.5	335.9	34.6		43.2	11.2	87.0		5.3
ATX85404-8	482.5	356.9	290.4	66.5		81.8	43.8	73.3		4.8
Snowden	449.7	387.9	288.7	99.2		32.2	29.7	86.0		6.3
FL-1851	343.3	240.2	203.6	36.6		29.5	73.6	70.9		6.0
FL-1863	457.1	396.7	265.8	130.9		27.8	32.6	86.8		7.1
A88356-1	380.1	296.0	204.1	91.9		18.8	65.4	77.8		7.5
FL-1900	429.2	341.2	300.8	40.4		49.1	39.0	79.7		5.6
NDA2031-2	555.5	425.3	405.9	19.4		73.3	56.8	76.2		5.3
Chipeta	521.6	372.9	225.2	147.7		23.9	124.9	71.6		8.0
AC87313-3	568.2	385.4	357.9	27.5		63.8	119.0	67.6		5.6
FL-1831	443.3	372.5	319.7	52.8		43.3	27.5	84.0		5.6
A87109-10	486.0	420.3	312.7	107.6		35.3	30.5	86.5		6.4
Mean	462.1	365.5	283.1	82.4		42.8	53.9	79.2		6.2
CV (%)	12.9	15.3	14.4	39.0		23.8	39.5	6.3		9.3
LSD (0.05)	84.5	79.3	57.9	45.6		14.4	30.2	7.1		0.8

¹ oz/tuber = total weight per plot / total tubers per plot; i.e. average tuber weight

Oregon Table 3. Quality characteristics and general descriptions of 18 chipping varieties & selections at Corvallis, OR. 1996.

Variety/Selection	Percent ¹			Percent ²			Comments
	K	GC	GR	HH	VD		
AC83306-1	0.2	3.8	6.9	31.7	11.7		Skinning, FBE, Too large, Fair
Atlantic	0.3	1.0	8.2	26.7	5.0		Good skin set, Fair
A88431-1	0.0	3.9	8.7	11.7	1.7		Attached stolons, Skinning, Some shatter, Fair
FL-1833	0.6	0.3	7.5	13.3	0.0		Uniform, Nice skin set, rot
CO87106-5	0.3	1.7	3.4	1.7	11.7		Uniform size and shape, Good skin set, Nice
BCO894-2	0.2	2.5	9.9	0.0	1.7		Smooth skin, Some pear shape, Attractive
FL-1867	0.1	0.5	0.5	10.0	0.0		Very uniform shape/size, Excellent skin set, Very Nice
ATX85404-8	0.3	0.5	5.6	26.7	0.0		Attached stolons, Skinning, Smallish, Fair
Snowden	0.0	0.3	5.7	8.4	3.4		Uniform size/shape, Good skin set, Nice
FL-1851	0.0	14.1	1.7	16.7	1.7		Severe FBE, Cracks, Ugly
FL-1863	0.0	0.2	6.2	10.0	1.7		Very uniform shape/size, Good skin set, Real Nice
A88356-1	0.4	3.8	8.7	25.0	5.0		Skinning, Attached stolons, Fair
FL-1900	0.1	2.6	2.8	55.0	1.7		Uniform, Good skin set, Nice
NDA2031-2	0.1	0.8	7.2	3.4	3.4		Attached stolons, Skinning, Nice except for skinning
Chipeta	2.1	5.8	11.4	5.0	3.3		Skinning, Attached stolons, Big, Lumpy shape, Ugly
AC87313-3	0.4	6.8	6.6	6.7	18.3		Uniform size/shape, Good skin set, Nice
FL-1831	0.1	0.7	3.8	5.0	1.7		Attached stolons, Skinning, Flat, Some FBE, Fair
A87109-10	0.3	0.0	4.5	3.3	5.0		Uniform shape, Good skin set, Some FBE, Good
Mean	0.3	2.7	6.1	14.4	4.3		
CV (%)	153.3	65.8	41.9	85.9	128.4		
LSD (0.05)	0.7	2.5	3.6	17.6	7.8		

¹ K = Knobs; GC = Growth Cracks; GR = Sunburn

² HH = Hollow Heart, VD = Vascular Discoloration; figures based on 15 US #1 tubers per replication

Oregon Table 4. Specific Gravity, fry color, and sprout characteristics of 18 chip varieties & selections at Corvallis, OR. 1996.

Variety/Selection	Specific Gravity ¹		Chip Color ³		Chip Color ³ 12/15/96		Percent Sprouted		Sprout Length ⁴	
	10/30/96	10/30/96	Agtron ²	40°	Agtron ²	50°	40°	50°	40°	50°
AC83306-1	1.082	45.5	37.3	42.5	0.0	0.0	0.0	0.0	0.0	0.0
Atlantic	1.082	44.1	31.8	41.5	0.0	1.7	0.0	0.0	0.0	0.03
A88431-1	1.093	45.0	36.9	41.6	0.0	0.0	0.0	0.0	0.0	0.00
FL-1833	1.085	44.8	36.5	43.4	0.0	0.0	0.0	0.0	0.0	0.00
CO87106-5	1.088	43.3	26.4	40.5	85.8	100.0	0.08	0.73	0.00	0.00
BCO894-2	1.074	42.4	34.3	43.0	0.0	0.0	0.0	0.0	0.0	0.00
FL-1867	1.089	45.7	37.2	43.7	0.0	0.0	0.0	0.0	0.0	0.00
ATX85404-8	1.082	44.4	35.5	44.4	0.0	53.7	0.0	0.15	0.00	0.00
Snowden	1.083	42.8	37.2	43.4	0.0	46.8	0.0	0.08	0.00	0.00
FL-1851	1.080	46.7	34.2	43.8	0.0	0.0	0.0	0.0	0.0	0.00
FL-1863	1.085	47.1	37.9	43.7	0.0	0.0	0.0	0.0	0.0	0.00
A88356-1	1.095	44.6	26.2	41.1	0.0	0.0	0.0	0.0	0.0	0.00
FL-1900	1.090	44.0	38.4	40.3	0.0	0.0	0.0	0.0	0.0	0.00
NDA2031-2	1.079	45.8	39.3	43.3	0.0	2.5	0.0	0.03	0.00	0.00
Chipeta	1.079	43.5	26.2	38.8	0.0	0.0	0.0	0.0	0.0	0.00
AC87313-3	1.082	45.2	31.9	41.6	0.0	87.1	0.0	0.40	0.00	0.00
FL-1831	1.093	44.6	39.3	44.3	0.0	4.4	0.0	0.03	0.00	0.00
A87109-10	1.087	45.3	29.4	41.0	0.0	7.2	0.0	0.03	0.00	0.00
Mean	1.085	44.7	34.2	42.3	4.8	16.9	0.006	0.082	0.00	0.00
CV (%)	0.332	3.7	9.8	4.6	25.6	63.4	0.00	68.2	0.00	0.00
LSD (0.05)	0.005	2.3	4.8	2.8	1.7	15.2	0.00	0.08	0.00	0.00

¹ Air/Water Method² Agtron reflectance value (red filter), high numbers = light color³ To determine PC/SFA value use the following formula: PC/SFA = (-0.113 * Agtron) + 6.70984⁴ Expressed in inches (values ≤ 0.125 = peeping)

Oregon Table 5. Fry color and sprouting characteristics of 18 chipping varieties and selections at Corvallis, OR. 1996.

Variety/Selection	Chip Color ¹ 2/15/97		Percent Sprouted 2/15/97		Sprout Length ³ 2/15/97	
	40°	50°	40°	50°	40°	50°
AC83306-1	31.9	42.4	100.0	100.0	0.11	4.1
Atlantic	24.1	38.6	100.0	100.0	0.28	5.6
A88431-1	30.0	42.0	0.0	100.0	0.00	1.9
FL-1833	30.3	41.5	100.0	100.0	0.11	0.5
CO87106-5	22.2	40.0	100.0	100.0	1.38	6.8
BCO894-2	28.6	40.8	100.0	100.0	0.27	2.8
FL-1867	32.9	44.9	75.0	100.0	0.05	1.7
ATX85404-8	32.4	40.0	100.0	100.0	1.63	6.4
Snowden	39.2	43.0	100.0	100.0	0.28	5.1
FL-1851	32.7	41.2	50.0	82.4	0.03	0.3
FL-1863	33.5	44.7	50.0	100.0	0.03	0.5
A88356-1	21.7	39.0	0.0	100.0	0.00	1.0
FL-1900	33.6	42.0	83.3	100.0	0.08	0.8
NDA2031-2	39.2	43.5	100.0	100.0	0.09	1.8
Chipeta	21.2	39.2	100.0	100.0	0.11	0.2
AC87313-3	29.0	38.7	100.0	100.0	0.50	2.6
FL-1831	36.1	42.2	100.0	100.0	0.13	5.5
A87109-10	31.8	41.8	100.0	100.0	0.06	2.0
Mean	30.6	41.4	81.0	99.0	0.28	2.7
CV (%)	8.8	6.9	27.0	16.0	68.3	37.8
LSD (0.05)	3.8	4.0	31.1	NS	0.28	1.5

¹To determine PC/SFA values use the following formula: PC/SFA = (-0.113 * Agtron) + 6.70984

²Agtron reflectance value (red filter), high numbers = light color

³Expressed in inches (Values ≤ 0.125 = peeping)

Oregon Table 6. Response to Late Blight pressure at Corvallis, OR. 1996.

Entry	Foliar Rating ¹	Tuber Rot Index ²	% Tuber Infect. ³
Atlantic	9.8	1.9	30.0
AO84275-3	8.0	0.3	7.5
Shepody	10.0	4.8	62.5
A81473-2	8.1	2.5	30.0
Russet Norkotah	10.0	8.5	87.5
ATX85404-8	9.0	3.3	45.0
FL-1625	6.5	0.4	10.0
A84118-3	8.8	0.0	7.5
Ranger Russet	8.8	5.3	82.5
A82360-7	8.4	0.3	7.5
Chipeta	8.5	5.8	60.0
COO83008-1	9.0	0.5	7.5
Snowden	9.8	1.6	27.5
Russet Burbank	9.4	1.5	20.0
Mean	8.8	2.6	34.6
CV (%)	9.6	47.0	29.8
LSD (0.05)	1.2	1.7	14.8

¹ 1 = Live, full foliage; 5 = 50% live foliage; 10 = 100% dead foliage on 9/20/96

² Rot severity rating (includes secondary infection): 1 = Healthy tubers; 10 = Probable Total Loss in Storage

³ Based on 10 randomly selected tubers/plot

Pennsylvania

B. J. Christ, M. W. Peck and D. M. Petrunak

The potato evaluation trial was conducted at the Russell E. Larson Agricultural Center at Rock Springs, PA. This trial is part of an extensive and on-going project that evaluates promising clones for yield, and chip processing potential. Clones that are identified as excellent performers are then evaluated in regional trials across Pennsylvania.

Materials and Methods

The trial was planted on May 24 in single row plots as a randomized complete block design with four replications. Plots were 10 feet in length with 36 inches between rows and 8 inches between seed pieces. Fertilizer, 929 lb/A of 10-10-10, N-P-K, was banded at planting. The plots were vine killed on September 15 and harvested on October 17.

Specific gravity was determined by the weight-in-air/weight-in water method. Tubers were held at ambient temperature until they were placed in storage. Samples were chipped four times throughout the winter. Four tubers from each clone were peeled, cut in half and sliced. Eight slices from the center of each half were used for the chip sample and were fried at 365 F. The chip samples were rated on a 1-10 scale according to a modified snack food color chart.

Results

May and June were cool and wet. However, the remainder of the season was hot and dry. There were 4.9, 1.3 and 0.8 inches of rainfall in June, July and August, respectively. The plots were irrigated at 1.5, 4.5 and 1.5 inches for July, August and the first week of September, respectively. There are numerous clones that had yield greater than Atlantic or Katahdin. However, of those clones with high yield, there are only 14 clones, B0178-34, B0766-3, B1027-6, AF1668-60, NY87, M28-3, N15-3, P7-19, P23-31, NDO1496-1, B0585-5, B1279-4, AF1426-1 and N50-3 that had out of field chip color lighter than Atlantic. Of these same high yielding clones, B0178-34, B0766-3, B1016-3, NY87, N15-3, P7-19, P23-31, NDO1496-1 and N50-3 also were chipping as light or better than Snowden out of storage. Other lines that were excellent chippers out of storage were AF1455-20, AF1556-3, E11-45, Pike, Andover, NY102, M14-1, M19-4, P29-1, ND2417-6 and P29-2

(Table 1). Potential tablestock clones with yield higher than Katahdin were NY101, NY103, Mainstay, AF1470-17, AF1455-20, AF1570-1, AF1612-8, AF1657-3, AF1675-1, B0984-3, B0856-4, B1088-37 and B1150-5. High yielding reds included B0811-3, N38-4, N51-1, P49-19R, B0984-1, P49-13R, P49-20R, and P50-4R (Table 2). The clones having the best red color skin out of storage were B0984-1, N51-1, B0811-13 and B0985-1. A high yielding clone with purple skin was B0967-11. Century Russet was the highest yielding russet with most of the pick outs, 36%, as oversized tubers.

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Pennsylvania Table 1. Total and >2" yield, percentage >2", specific gravity, and chip color results from potato evaluation trial in Centre County, Pennsylvania.

Cultivar	Yield (cwt/A)		%>2"	Specific Gravity	Chip Color				
	Total	>2"			Nov ¹	Dec ²	Jan ³	Feb ⁴	Jan ⁵
Replicated									
Atlantic	479	461	95	1.091	6	6	6	6	7
Katahdin	492	463	94	1.073	-	-	-	-	-
Elba	477	455	95	1.079	-	-	-	-	-
Norchip	477	417	87	1.080	6	6	7	6	8
Snowden	564	504	89	1.091	6	4	4	3	6
Superior	517	489	95	1.078	6	7	-	-	-
B0178-34	447	416	92	1.097	6	5	5	5	6
B0564-8	564	514	91	1.084	5	5	6	7	7
B0564-9	459	439	95	1.081	7	6	7	7	8
B0766-3	442	428	97	1.088	5	5	5	4	7
B0856-4	467	451	96	1.068	6	6	7	7	8
B1083-51	391	378	97	1.087	7	7	8	7	9
B1110-11	342	305	89	1.079	5	5	6	5	7
B1248-5	437	393	90	1.077	6	7	8	8	9
AF1425-1	414	364	88	1.075	5	6	7	7	8
AF1426-1	368	367	100	1.075	6	5	7	7	7
AF1433-4	294	277	94	1.078	4	4	6	4	7
AF1455-20 (Quaggy Joe)	363	342	94	1.088	6	7	8	6	7
AF1470-17	351	325	92	1.076	8	-	-	-	-
AF1556-3	307	292	95	1.079	5	5	5	5	7
AF1565-12	405	352	87	1.067	7	8	8	8	10
AF1568-6	245	167	67	1.077	4	5	7	5	7
AF1569-3	321	292	91	1.073	6	7	8	9	9
AF1570-1	383	356	94	1.079	5	6	8	8	8
AF1612-8	429	356	82	1.075	8	7	8	9	9
AF1668-62	283	249	88	1.086	4	4	5	4	7
AF1675-1	440	399	91	1.081	8	9	8	8	9
AF1713-1	298	261	87	1.071	7	7	9	9	10
AF1714-2	343	319	93	1.074	8	7	8	8	9
AF1763-2	450	378	83	1.062	8	8	9	9	10
AF1764-12	406	379	94	1.076	7	7	9	9	10
AF1774-12	373	336	90	1.072	8	8	10	9	10
AF1774-2	436	404	92	1.066	9	10	10	10	10
AF875-15	308	281	92	1.084	5	5	5	6	7
Mainestay	681	647	95	1.077	-	-	-	-	-
NDO1496-1	391	374	96	1.088	3	4	4	3	5
ND2417-6 (NorValley)	444	397	89	1.078	4	4	5	4	5
ND2471-8	412	352	86	1.085	6	5	6	5	7
ND2676-10	491	449	91	1.080	3	4	4	4	5
NY87	518	497	95	1.080	6	6	6	5	8
NY99	371	331	89	1.070	6	6	-	-	-
NY101	587	546	93	1.074	7	6	7	7	8
NY103	479	444	92	1.077	6	6	7	6	7
NY107	486	444	91	1.084	5	6	6	5	7
NY108	448	428	96	1.084	5	6	7	6	7
NY109	532	490	92	1.068	7	6	7	7	8
NY111	506	458	90	1.090	5	4	6	6	7
NY115	427	395	93	1.079	3	3	4	4	6
NY117	554	526	95	1.085	7	6	7	6	7
E11-45	564	523	93	1.068	6	7	6	6	7
P13-5	433	405	93	1.074	6	6	6	6	7
P21-2	641	602	94	1.078	5	5	6	7	7

Pennsylvania Table 1. Continued.

Cultivar	Yield (cwt/A)		%>2"	Specific Gravity	Chip Color				
	Total	>2"			Nov ¹	Dec ²	Jan ³	Feb ⁴	Jan ⁵
P21-5	435	392	90	1.073	6	4	5	5	6
P21-9	415	382	92	1.078	4	4	6	6	7
P21-12	411	394	96	1.088	6	5	7	7	7
P21-20	393	371	94	1.083	6	6	7	7	7
P32-3	441	409	93	1.085	5	5	5	5	6
P63-1	332	299	90	1.089	4	4	4	4	7
P64-3	357	324	91	1.081	3	3	5	5	5
P73-1	497	466	94	1.081	6	5	6	5	7
Q8-2	489	475	97	1.089	4	5	6	5	6
Q38-1	276	234	85	1.085	5	4	5	5	6
Q38-2	387	310	80	1.090	4	4	5	5	5
Q47-1	453	432	95	1.078	4	4	4	5	6
Bettina §	521	462	89	1.075	7	7	8	7	10
Carlingford	601	545	91	1.071	7	7	7	7	8
Maris Bard	516	506	98	1.071	7	7	9	8	9
Navan	593	523	88	1.081	6	6	7	7	8
Rocket	547	513	94	1.073	8	8	8	8	9
Saxon	587	538	92	1.063	7	7	7	7	10
Sierra §	560	524	94	1.075	7	7	8	7	9
Van Gogh §	734	661	90	1.092	8	7	8	8	9
Frisa	666	599	90	1.079	6	6	7	7	8
Morning Gold §	616	564	92	1.076	6	7	7	6	7
LSD (p = 0.05)	172	164	4						
Reds									
Norland	382	346	90	1.061	-	-	-	-	-
Chieftain	521	497	95	1.071	-	-	-	-	-
B0811-4 §	228	159	68	1.086	-	-	-	-	-
B0811-13 §	613	566	92	1.075	-	-	-	-	-
B0852-7	539	496	92	1.079	-	-	-	-	-
B0967-11	639	598	94	1.081	-	-	-	-	-
B0984-1	491	475	97	1.080	-	-	-	-	-
B1102-3	406	286	70	1.071	-	-	-	-	-
B1145-2	448	376	84	1.064	-	-	-	-	-
ND2225-1R	438	327	75	1.062	-	-	-	-	-
Nordonna	464	410	88	1.068	-	-	-	-	-
Symfonia §	592	483	80	1.086	-	-	-	-	-
LSD (p = 0.05)	97	105	8						
Nonreplicated									
B1065-51	382	369	97	1.081	6	7	8	7	9
B1066-73	520	497	96	1.079	4	6	7	7	8
B1072-21	477	467	98	1.075	6	7	7	6	8
B1091-29	427	398	93	1.085	6	6	8	7	9
B1150-5	519	463	89	1.063	6	6	9	7	9
B1206-10	350	336	96	1.077	5	5	8	6	10
B1214-7	521	504	97	1.087	7	7	8	8	9
B1240-12	526	499	95	1.087	6	5	8	7	9
B1240-14	614	592	96	1.080	5	4	6	5	8
B1309-23	274	255	93	1.076	7	6	9	7	10
B1332-26	450	427	95	1.081	8	8	10	9	10

Pennsylvania Table 1. Continued.

Cultivar	Yield (cwt/A)		%>2"	Specific Gravity	Chip Color				
	Total	>2"			Nov ¹	Dec ²	Jan ³	Feb ⁴	Jan ⁵
B1394-4	505	450	89	1.091	5	7	5	5	6
AF1657-3	332	309	93	1.076	7	7	9	8	10
AF1753-12	426	377	89	1.070	7	7	9	9	10
AF1758-5	664	638	96	1.073	6	6	7	6	8
AF1758-7	507	482	95	1.064	8	7	10	8	10
AF1764-6	511	453	89	1.069	7	7	10	8	10
AF1764-9	551	524	95	1.081	6	7	10	8	10
AF1766-2	501	481	96	1.084	8	8	10	8	9
AF1769-1	340	315	93	1.087	7	8	8	8	9
AF1769-9	368	333	91	1.072	6	5	9	7	9
AF1771-2	423	417	98	1.083	8	7	9	8	10
AF1774-14	239	221	92	1.089	5	-	5	4	7
AF1774-15	414	389	94	1.066	8	9	10	10	10
AF1774-22	277	229	83	1.069	7	8	10	9	10
AF1775-2	764	739	97	1.090	6	7	7	7	8
AF1787-2	316	290	92	1.061	7	7	8	7	8
P5-2	436	422	97	1.073	4	6	8	6	7
P13-1	521	481	92	1.089	6	7	7	7	8
P21-19	374	323	87	1.088	4	4	5	6	7
P63-2	352	262	74	1.082	3	3	6	3	7
P73-2	492	402	82	1.087	4	5	6	5	7
Q3-12	321	294	91	1.079	4	4	6	5	7
Reds									
B0985-1	357	321	90	1.062	-	-	-	-	-

¹ Nov = November 13-14, 1996. Tubers were stored in a pole barn exposed to fluctuating temperatures.

² Dec = Stored at 55° F from November 11, 1996 and chipped on December 11, 1996.

³ Jan = Stored at 45° F from November 18, 1996 then transferred to 55° F three weeks prior to chipping on January 29 - 30, 1997.

⁴ Feb = Stored at 45° F from November 18, 1996 then transferred to 55° F six weeks prior to chipping on February 18, 1997.

⁵ Jan = Stored at 45° F from November 18, 1996 and chipped on January 23, 1996.

§ = Yellow Flesh

Chip color is based on a 1-10 scale with 1 = lightest, 10 = darkest, 1-5 = acceptable chip color.

Texas

J. Creighton Miller, Jr. and Douglas G. Smallwood

Variety Development Testing

Seedling Program. Approximately 35,616 first-year seedlings, representing 253 families, were grown for selection near Springlake, in 1996, and 88 original selections were made from this material. The 1996, first-year seedlings from Texas resulted from crosses made at the Texas Agricultural Experiment Station near Lubbock. The remainder were obtained from Joe Pavak in Idaho (18,076), David Holm in Colorado (10,292) and Kathy Haynes in Beltsville, Maryland (5,120).

Adaptation Trials. The 1996 growing season was marked by above normal temperatures in May and near average temperatures in June and July. In general, vine growth was above average. The variety and advanced selection trials at Springlake were planted on March 28 and harvested on August 20. Twenty-three russet varieties or advanced selection were tested for their adaptability to Texas conditions (Table 1). The outstanding entries based on total yield and general rating were Century Russet, ATX84706-2Ru and TXNS112 (CO, Gunnels). Others deserving mention based on general rating were TX1229-2Ru, A81286-1, TX1385-12Ru, TXNS112(CO, Salazar), A81386-1(ID), TXNS118(CO, Salazar), TXAV657-27, ATX84378-1Ru and A84180-8(ID). The selection ATX84378-1Ru continues to show promise as a new variety for the Texas and Eastern New Mexico production areas because of its early maturity and rapid bulking, as well as its count carton potential and heavy netting with associated resistance to skinning. Century Russet, ATX84706-2Ru, A81286-1 and TX1385-12Ru each produced more than 200 cwt/A of 10-18 oz. tubers. Entries producing average tuber weights exceeding 8 oz. included Century Russet, ATX84706-2Ru, TXNS112(CO, Gunnels), TX1229-2Ru, A81286-1, TX1385-12Ru and A84180-8(OR). Generally, the Texas Norkotah strains, TXNS112, TXNS118 and TXNS278, produced larger tubers than regular Russet Norkotah.

The outstanding red entries were NDO2438-6 and NDTX8-731-8R (Table 2). Others deserving mention were NDTX4304-1R, ND2225-1R, COTX86146-2R and NDO4323-2. The entries Red LaSoda, COTX86146-2R and NDO2438-6 produced significantly more 10-18 ounce tubers than all other entries. Those entries with 70% or more U.S. No. 1's included NDO2438-6, Red LaSoda, and COTX86146-2R. The entries with 50% or more under 4 ounce tubers included NDO4323-2,

NDTX4271-5R, ND2225-1R, DT6063-1R, A82705-1R, NDO3994-2 and NorDonna (data not shown). High market prices have been paid recently for small red potatoes with bright red color. Over all, the performance of DT6063-1R and Viking was very disappointing, as was the appearance of Sangre which was also very late in maturity.

Thirteen white varieties or advanced selections were also tested for their adaptability (Table 3). The outstanding entries based on total yield and general rating were COTX90046-1W, Itasca, NDTX4930-5W and ND3828-15. Other entries deserving mention based on general rating include Yukon Gold, COTX90046-5W and Chipeta. Those entries with 80% or more U.S. No. 1's included COTX90046-1W, ND3828-15 and Yukon Gold. Three yellow flesh varieties, Yukon Gold, Alpha and Vokal, were included in this trial. There was no significant difference in total yield among the three varieties; however, Yukon Gold produced a significantly higher percentage of U.S. No. 1 and 10-18 ounce grade tubers than either Alpha or Vokal. The performance of ATX85404-8W was extremely poor and very atypical.

The russet strip trial consisted of three russet varieties and eleven promising advanced selections for which sufficient seed was available for strip planting of 200 foot rows. Strip trials more closely duplicate grower conditions and represent a more advanced phase of testing than replicated variety trials. Four randomly selected plots of each entry were harvested. The outstanding entries based on total yield and general rating were Century Russet, TX1385-12Ru, TXNS112, TXNS118, Russet Norkotah and TXAV657-27 (Table 4). Century Russet and TX1385-12Ru produced significantly more 10-18 ounce grade potatoes than all other entries. TX1385-12Ru has slightly rough oblong tubers with a light russet net. This entry produced tubers which were significantly higher in average tuber weight than all other entries. The Texas Norkotah strains tended to produce larger tubers than regular Russet Norkotah. Other entries deserving mention based on general rating include TXNS278, Norgold "M", A84180-8 and ATX84378-1Ru. The selection A84180-8 is a very attractive, long russet with a high percentage of large tubers. The yield of ATX84378-1Ru was somewhat disappointing this year. ATX84378-1Ru produces very uniformly shaped oblong tubers with a heavy russet skin; however, this selection can develop growth cracks and hollow heart when tubers become very large.

Three red varieties and five advanced selections were also grown in a strip trial to evaluate their adaptability to Texas High Plains conditions. The outstanding entries

based on overall general rating were Red LaSoda and NDTX8-731-8R (Table 5). A82705-1R, ND2225-1R and NDO4323-2 produced significantly more under 4 oz. tubers, which might indicate potential for specialty/creamer packs. Red LaSoda produced a significantly greater number of large tubers (6-10 and 10-18 oz) than all other entries. NDTX8-731-8R produced a large percentage of 4-6 ounce grade tubers with uniform shape and size and dark red color (data not shown). This selection continues to show potential as a new variety for the Texas High Plains. The performance of Viking was unusually poor.

Twelve advanced selections which were selected between 1986 and 1993 were evaluated for yield and quality (Table 6). The selections were made in Texas and resulted from crosses made in Colorado, Idaho and North Dakota. Red LaSoda, Viking, Atlantic, Century Russet and Russet Norkotah were grown as check varieties. The outstanding entries based on general rating were Red LaSoda, NDTX4304-1R, ATX87252-2Ru, Century Russet, ATX87138-2Ru, ATX90480-4W, Russet Norkotah and NDTX4271-5R. The advanced selection ATX87252-2Ru produced significantly larger tubers than all other entries. A number of the entries produced equal or better total yields than the check varieties.

Texas Table 1. Total yield, yield of U.S. No. 1, average tuber weight, specific gravity, tuber type, skin type and general rating of 23 russet potato varieties or advanced selections grown at Springlake, Texas - 1996.

Variety or Selection	TOTAL YIELD CWT/A	CWT/A		Specific Gravity	Tuber Type	Skin Type	General Rating ^{1/}
		U.S. No. 1	10-18 oz.				
Century Russet	474.1	429.1	210.3	1.062	Long	Russet	4.5
ATX84706-2Ru	436.8	406.1	250.0	1.069	Oblong	Russet	4.5
TXNS112 (CO, Gunnels) ^{2/}	402.4	379.9	191.4	1.057	Long	Russet	4.5
Goldrush	366.4	319.9	121.5	1.054	Oblong	Russet	3.5
TX1229-2Ru	356.0	324.8	178.1	1.067	Oblong	Russet	3.8
A81286-1	349.9	334.2	214.2	1.062	Oblong	Russet	4.0
TX1385-12Ru	347.0	327.4	245.9	1.064	Oblong	Russet	4.0
TXNS112 (CO, Salazar)	346.5	317.5	150.8	1.057	Long	Russet	4.0
A81386-1 (ID)	337.1	307.8	91.7	1.061	Long	Russet	3.8
Russet Norkotah	328.2	284.6	95.6	1.061	Oblong	Russet	3.5
TXNS118 (CO, Salazar)	324.5	292.6	130.0	1.059	Long	Russet	3.8
ATX91137-1Ru	318.7	261.8	23.2	1.055	Oblong	Russet	3.5
Norgold "M"	314.1	268.6	90.5	1.061	Oblong	Russet	3.5
TXAV657-27	300.1	255.1	48.9	1.065	Oblong	Russet	4.5
TX1523	286.8	220.9	30.5	1.065	Oblong	Russet	3.0
TXNS278 (CO, Gunnels)	282.4	251.4	95.8	1.058	Long	Russet	3.5
TXNS278 (CO, Salazar)	280.7	249.5	100.9	1.063	Long	Russet	3.5
A81386-1 (OR)	271.8	209.6	31.5	1.066	Oblong	Russet	3.0
ATX84378-1Ru	253.4	228.0	97.0	1.062	Oblong	Russet	4.0
A84180-8 (ID)	247.1	230.9	144.7	1.059	Long	Russet	3.8
A86102-6	234.3	183.7	48.2	1.076	Oblong	Russet	2.5
NDTX3773-1Ru	228.0	171.6	35.6	1.066	Oblong	Russet	2.5
A84180-8 (OR)	227.2	210.5	140.1	1.059	Long	Russet	3.5
TX1216-1Ru	226.3	160.2	18.9	1.059	Oblong	Russet	2.0
COTX87061-2Ru	200.9	165.3	54.7	1.052	Oblong	Russet	3.0
Russet Nugget	196.0	99.9	1.7	1.073	Oblong	Russet	2.0
AC83064-1	165.3	113.5	0.0	1.069	Oblong	Russet	2.0
Average	300.1	259.4	105.2	1.062			3.5
L.S.D. (.05)	64.0	68.6	59.2				

^{1/} 1 = very poor to 5 = excellent

^{2/} Seed source indicated in parenthesis

Texas Table 2. Total yield, yield of U.S. No.1, average tuber weight, specific gravity, tuber type, skin type and general rating of 23 red potato varieties or advanced selections grown at Springlake, Texas - 1996.

Variety or Selection	TOTAL YIELD CWT/A	CWT/A		Average	Specific Gravity	Tuber Type	Skin Type	General Rating 1/ 2
		U.S. No.1	10-18 oz.	Tuber Weight in oz.				
Sangre	342.9	185.9	15.2	4.7	1.059	Oblong	Red	2.5
NDO2438-6	327.2	243.9	74.3	6.0	1.054	Round	Red	4.5
Red LaSoda	323.6	234.0	46.5	6.2	1.058	Oblong	Red	3.5
A82705-1R	288.9	73.1	0.0	3.4	1.053	Oblong	Red	3.5
ND2225-1R	280.0	62.0	0.0	3.0	1.065	Round	Red	3.8
NDTX8-731-8R	274.2	183.2	9.4	5.1	1.059	Round	Red	4.5
NorDonna	267.2	112.5	0.0	3.9	1.057	Round	Red	3.5
NDTX4271-5R	248.8	55.7	0.0	3.8	1.057	Round	Red	3.5
NDTX4304-1R	242.5	156.3	9.7	4.9	1.054	Round	Red	3.8
COTX86146-2R	242.0	186.8	49.4	5.4	1.059	Oblong	Red	3.8
ND3574-5R	230.1	151.0	14.8	5.3	1.061	Round	Red	3.5
NDO4323-2	225.8	24.4	0.0	2.7	1.060	Round	Red	3.8
NDO3994-2	201.1	72.8	0.0	3.7	1.066	Round	Red	2.8
DT6063-1R	136.2	32.4	0.0	3.7	1.069	Oblong	Red	2.8
Viking	129.0	64.1	0.0	4.3	1.067	Oblong	Red	2.5
Average	250.6	122.5	14.6	4.4	1.058			3.5
L.S.D. (.05)	63.4	76.1	23.8	0.9				

1/ 1 = very poor to 5 = excellent

Texas Table 3. Total yield, yield of U.S. No.1, average tuber weight, specific gravity, tuber type, skin type and general rating of 13 white potato varieties or advanced selections grown at Springlake, Texas - 1996.

Variety or Selection	TOTAL YIELD CWT/A	CWT/A		Average Tuber Weight in oz.	Specific Gravity	Tuber Type	Skin Type	General Rating ^{1/}
		U.S. No.1	10-18 oz.					
COTX90046-1W	346.8	297.4	85.2	6.6	1.067	Round	White	3.5
Itasca	317.0	201.3	15.7	4.1	1.064	Oblong	White	3.5
COTX90046-2W	308.8	194.3	27.1	4.7	1.062	Round	White	3.0
NDTX4930-5W	304.2	236.4	50.8	5.9	1.077	Oblong	White	3.8
ND3828-15	295.0	238.6	49.4	6.2	1.073	Oblong	White	3.8
ND2417-6	284.1	116.9	3.1	3.9	1.069	Oblong	White	3.5
Yukon Gold	272.5	219.7	43.8	6.0	1.070	Oblong	White	4.0
Atlantic	267.9	146.2	5.3	4.9	1.078	Round	White	3.5
Alpha	263.5	50.1	0.0	2.7	1.077	Oblong	White	2.8
Vokal	254.6	97.3	0.0	3.7	1.060	Oblong	White	2.8
COTX90046-5W	245.9	186.3	43.1	5.7	1.066	Round	White	3.8
Chipeta	230.4	167.9	32.4	5.4	1.070	Round	White	3.8
ATX85404-8W	118.8	7.7	0.0	2.7	1.069	Round	White	3.0
Average	270.0	166.2	27.4	4.8	1.069			3.4
L.S.D. (.05)	78.5	70.4	26.9	0.9				

^{1/} 1 = very poor to 5 = excellent

Texas Table 4. Total yield, yield of U.S. No. 1, average tuber weight, specific gravity, tuber type, skin type and general rating of 14 russet potato varieties or advanced selections grown in a strip trial at Springlake, Texas - 1996.

Variety or Selection	TOTAL YIELD CWT/A	CWT/A		Average Tuber Weight in oz.	Specific Gravity	Tuber Type	Skin Type	General Rating ^{1/}
		U.S. No. 1	10-18oz.					
Century Russet	526.3	472.1	214.9	8.0	1.061	Long	Russet	3.8
TX1385-12Ru	367.4	345.3	245.9	11.1	1.064	Oblong	Russet	3.5
TXNS112	349.0	317.5	153.2	7.3	1.057	Long	Russet	3.5
TXNS118	311.0	282.9	127.5	6.7	1.058	Long	Russet	3.5
Russet Norkotah	299.1	255.6	66.5	5.7	1.061	Oblong	Russet	3.5
TXA V657-27	298.9	249.0	47.4	6.4	1.065	Oblong	Russet	3.5
TX1523	279.5	213.7	30.5	5.0	1.065	Oblong	Russet	2.0
TXNS278	279.5	254.1	118.8	6.6	1.066	Long	Russet	3.5
Norgold "M"	277.8	239.6	90.5	7.0	1.061	Oblong	Russet	3.5
TX1216-1Ru	248.5	187.6	33.4	5.6	1.060	Oblong	Russet	2.8
A84180-8	232.1	205.0	120.0	7.1	1.060	Long	Russet	3.8
ATX84378-1Ru	221.9	203.8	72.8	7.4	1.062	Oblong	Russet	3.5
NDTX3773-1Ru	191.7	147.4	35.6	5.4	1.066	Oblong	Russet	3.5
AC83064-1	174.7	122.5	0.0	4.4	1.060	Oblong	Russet	2.8
Average	289.8	249.7	96.9	6.7	1.062			3.3
L.S.D. (.05)	55.4	58.4	38.7	0.9				

^{1/} 1 = very poor to 5 = excellent

Texas Table 5. Total yield, yield of U.S. No.1, average tuber weight, specific gravity, tuber type, skin type and general rating of 8 red potato varieties or advanced selections grown in a strip trial at Springlake, Texas - 1996.

Variety or Selection	TOTAL YIELD CWT/A	CWT/A		Average Tuber Weight in oz.	Specific Gravity	Tuber Type	Skin Type	General Rating ^{1/}
		U.S. No.1	10-18 oz.					
Red LaSoda	335.7	235.2	54.9	6.3	1.058	Oblong	Red	4.0
NDTX8-731-8R	276.6	202.6	9.4	5.2	1.059	Round	Red	4.5
A82705-1R	267.7	51.8	0.0	3.2	1.053	Oblong	Red	2.8
ND2225-1R	262.1	44.0	0.0	2.9	1.065	Round	Red	3.0
NorDonna	235.7	107.7	0.0	3.6	1.057	Oblong	Red	2.8
NDO4323-2	211.3	9.9	0.0	2.6	1.060	Round	Red	2.5
NDO3994-2	210.3	97.0	0.0	3.9	1.065	Round	Red	3.0
Viking	124.1	71.4	0.0	4.4	1.067	Oblong	Red	3.5
Average	240.4	102.5	8.0	4.0	1.058			3.3
L.S.D. (.05)	52.8	39.7	14.5					

^{1/} 1 = very poor to 5 = excellent

Texas Table 6. Total yield, yield of U.S. No.1, average tuber weight, specific gravity, tuber type, skin type and general rating of 13 Colorado-Texas, Idaho-Texas and North Dakota-Texas advanced selections and 5 check varieties of potatoes grown at Springlake, Texas - 1996.

Variety or Selection	TOTAL YIELD CWT/A	CWT/A		Average Tuber		Specific Gravity	Tuber Type	Skin Type	General Rating ^{1/}
		U.S No. 1	10-18 oz.	Weight in oz.					
Red Lasoda	425.2	232.3	55.4	4.7	1.054	Oblong	Red	3.8	
COTX90046-5Ru	423.7	349.0	121.5	7.2	1.069	Round	White	3.0	
NDTX4304-1R	379.9	243.5	45.0	5.0	1.051	Round	Red	3.8	
ATX87252-2Ru	318.7	281.4	119.1	8.3	1.067	Oblong	Russet	3.5	
Century Russet	313.6	245.1	100.9	6.4	1.068	Long	Russet	4.5	
ATX87138-2Ru	296.0	244.2	88.1	6.3	1.063	Oblong	Russet	3.5	
NDTX4930-5W	263.3	86.6	0.0	3.7	1.066	Oblong	White	3.0	
ATX90480-4W	249.7	191.2	47.9	5.4	1.071	Oblong	White	3.8	
Atlantic	247.6	121.0	3.6	4.4	1.074	Round	White	3.0	
Russet Norkotah	238.1	175.9	48.2	5.7	1.062	Oblong	Russet	3.8	
COTX87061-2Ru	229.4	192.9	69.0	6.3	1.058	Long	Russet	3.0	
Viking	226.5	69.5	0.0	3.8	1.060	Oblong	Red	2.8	
COTX90046-1W	220.2	136.5	14.8	4.5	1.058	Round	White	3.0	
ATX91137-1Ru	209.1	168.7	42.8	5.9	1.056	Long	Russet	3.0	
NDTX4271-5R	191.7	157.8	56.1	5.3	1.052	Oblong	Red	3.8	
NDTX4828-2R	176.2	78.4	0.0	3.8	1.059	Round	Red	3.0	
NDTX5067-2R	110.4	56.6	0.0	3.8	1.065	Round	Red	3.0	
NDTX4831-3R	99.7	1.5	0.0	2.4	1.050	Round	Red	3.0	
Average	256.6	168.4	45.1	5.1	1.061			3.3	
L.S.D. (.05)	71.7	66.4	32.2	0.8					

^{1/} 1 = very poor to 5 = excellent

Virginia

S. B. Sterrett and C. P. Savage, Jr.

Introduction

Trials were conducted at the Eastern Shore Agricultural Research and Extension Center in Painter, Virginia. Since round-white potatoes are grown commercially in this area for both fresh market and chip stock, these trials evaluate promising clones for yield, tuber quality and appearance, vine and tuber maturity, processing (chip) potential and freedom from internal and external defects. To address potential marketing niches, red-skinned and russeted clones are also evaluated for suitability in this growing area.

Methods

All trials were planted on a Bojac sandy loam soil on March 27 except the transgenic trial which was planted on April 15. Single row plots were 25 feet in length with 36 inches between rows and 12 inches between seedpieces within the row for round-white and russeted trials, 8 inches within row for red-skinned trial. Transgenic plots were 35 ft in length with a common, non-transgenic guard row between each plot. Trials were planted using a randomized complete block statistical design with four replications except the transgenic with 8 replications. Fertilizer (100 lbs N, 43.7 lbs P, and 83 lbs K/A) was banded at planting with carbofuran (3 lb ai/A) + imidacloprid (0.3 lbs ai/A) banded in the furrow for Colorado potato beetle control. Nitrogen (50 lbs/A) was sidedressed 54 days after planting. Linuron (0.5 lb ai/A) and metolachlor (1.5 lbs ai/A) were applied at dragoff on April 22 except for transgenic on April 28. Round-white trials were harvested July 8, red-skinned trials on August 8, and the transgenic trial on July 25. Specific gravity was determined by the weight-in-air/weight-in-water method. Chip samples were held at ambient temperature and chipped 2 and 8 days after harvest.

Seasonal Observations

Growing conditions were nearly ideal, with cool temperatures and evenly spaced rainfall through June. A total of 14.4 inches of rain fell in July, 14 inches occurring after July 12. The russet trial was lost because of excessive tuber rot.

Results

Round-white Trial. Marketable yield of AF1774-15 and NY109 were significantly greater than that of Superior but neither have potential for processing into potato chips from this growing area. Both clones may be susceptible to

internal heat necrosis. Incidence of tuber defects (second growth and growth cracks) was excessive for AF1658-5, AF1774-15, AF1772-2, and AFSC8801-2.

Chip Trial. Further evaluation for fresh market is warranted for clone B0856-4 with yield similar to Atlantic and attractive tubers that are free of internal and external defects. Low gravity and poor chip color limits the potential of B0856-4 for chip processing. Yield of B1078-34, B1081-4, and NY112 was similar to Atlantic with high specific gravity and good to moderate chip color. Rough irregular tuber appearance and susceptibility to internal and external defects preclude the need for additional evaluations of B1081-4. NY112 may have potential as a late maturing chipping cultivar.

Commercial. Most of the cultivars tested were European in origin. Generally, poor yield and susceptibility to external defects are significant concerns for these cultivars. While the yield and tuber appearance of Adora were acceptable, excessive heat sprouts and growth cracks would limit commercial potential. None of these cultivars appear to be well adapted to the growing conditions of Eastern Virginia.

Red-skinned Trial. The delay in harvest caused by the prolonged rainy period in July was not conducive to attractive tubers or bright skin color. In a commercial planting, the netted skin of B0811-13 proved to be excessive for fresh market sales.

Transgenic Trial. Of the Superior clones, SP02-05 was inferior to the standard in yield and quality (Table 6). Differences between Snowden clones were less apparent (Table 6, 7). However, with the exception of SN15-40, specific gravity of the transgenic lines were significantly lower than that of the non-transgenic standard. There was a significant difference in size distribution in both the Superior and the Snowden trials, with a higher percentage of tubers >3.25" reported for the standards than the transgenic clones.

Ratings.

Vine and tuber ratings were completed using the rating system of the U. S. Department of Agriculture regional project NE107. For vine ratings, maturity: 1 = senesced, 9 = totally green; air pollution: 1 = defoliated, 9 = no visible symptoms. For tuber ratings, shape: 1 = round, 5 = oblong, 9 = very long (cylindrical); appearance: 1 = very poor, 9 = excellent; skin maturity: 1 = totally peeled during harvest and grading, 9 = skin intact, and tuber defects: 1 = severe, 9 = none. Ratings of heat necrosis were made on 20 tubers in the size range 2-1/2" to 3-1/4".

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Virginia Table 1. Yield, marketable yield, percentage of yield by grade size distribution, specific gravity, and chip color of advanced round-white trial grown for 103 days at Painter, Virginia, 1996.

Clone ¹	Yield		Marketable Yield		Size Distribution ²				Specific Gravity ³	Chip Color ⁴	
	> 1-1/2"	cwt/A	cwt/A	Percentage of std.	1	2	3	4		2	8
Atlantic	356		296	99	16	16	52	16	1.098	2	4
Superior (std.)	340		298	100	11	13	55	19	1.074	4	7
AF1658-5	261		204	68	18	18	49	12	1.081	---	---
AF1763-2	393		305	102	22	22	50	6	1.066	---	---
AF1764-6	335		206	69	37	27	34	0	1.077	---	---
AF1767-9	418		344	115	16	18	54	11	1.081	---	---
AF1774-14	391		335	112	13	19	58	9	1.078	5	7
AF1774-15	452		378	127	15	20	59	5	1.066	5	7
AF1777-2	295		246	83	12	14	61	9	1.082	---	---
AFSC8801-2	344		259	87	17	15	42	17	1.067	6	9
B1027-6	346		245	82	25	22	45	5	1.089	3	3
NY101	416		348	117	15	14	49	20	1.079	3	5
NY109	450		389	131	12	14	54	18	1.070	5	6
Waller-Duncan											
(k=100, P = 0.05)	65		61								

¹Planted March 27, harvested July 8, 1996.

²Size distribution 1 = 1.5-1.88"; 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = > 3.25."

³Determined by weight in air/weight in water method.

⁴Unreplicated samples: 1-4 = acceptable, 5 = marginal, 6 or greater = unacceptable.

Virginia Table 2. Yield, marketable yield, percentage of yield by grade size distribution, specific gravity, and chip color of chip trial grown for 103 days at Painter, Virginia, 1996.

Clone ¹	Yield > 1-1/2"	Marketable Yield		Percentage of std.	Size Distribution ² by class (%)				Specific Gravity ³	Chip Color ⁴ (Days After Harvest)	
		cwt/A	cwt/A		1	2	3	4		3	8
Asterix	213	113	39	43	33	18	0	1.085	7	9	
Atlantic (std.)	348	290	100	15	16	55	12	1.093	3	4	
Sierra	108	69	24	31	22	38	2	1.066	6	9	
Superior	347	312	108	8	10	54	25	1.072	4	7	
AF1753-1	364	274	94	23	22	50	3	1.068	5	6	
AF1756-6	275	134	46	46	35	13	0	1.069	3	6	
BO856-4	409	326	112	16	10	42	28	1.067	5	3	
B1071-20	339	233	80	28	24	42	3	1.076	6	9	
B1072-21	231	198	68	11	15	51	20	1.068	3	8	
B1078-34	340	292	101	13	17	55	14	1.096	3	5	
B1081-4	330	253	87	19	20	55	3	1.095	3	5	
B1088-37	391	280	97	11	14	48	10	1.072	3	8	
B1157-5	308	187	64	37	29	31	1	1.072	4	5	
NY112	316	265	97	15	21	55	8	1.086	2	3	
NY113	295	244	84	16	16	50	16	1.067	2	3	
NY114	363	303	104	15	16	51	17	1.079	4	6	
NY115	316	242	83	22	21	50	6	1.077	3	3	
Waller-Duncan											
(k=100, P = 0.05)	46	45									

1-4 See Table 1.

Virginia Table 3. Yield, marketable yield, percentage of yield by grade size distribution, specific gravity, and chip color of commercial trial grown for 104 days at Painter, Virginia, 1996.

Clone ¹	Yield	Marketable Yield		Size Distribution ²				Specific Gravity ³	Chip Color ⁴		
	> 1-1/2"	cwt/A	cwt/A	Percentage of std.	1	2	3		4	(Days After Harvest)	1
Adora	279	210		89	20	19	48	7	1.060	7	7
Aminca	270	135		57	43	32	17	0	1.081	---	---
Atlantic	265	212		90	19	21	49	8	1.095	---	---
Bettina	125	32		14	72	16	10	0	1.086	---	---
Bintge	220	52		22	45	15	8	1	1.078	---	---
Carlingford	165	68		29	61	17	19	1	1.075	---	---
Dali	97	19		08	56	16	2	0	1.073	---	---
Disco	184	84		36	50	28	17	1	1.087	---	---
Drago	230	171		72	23	19	43	11	1.072	---	---
Erntestolz	132	38		16	67	14	15	0	1.103	---	---
Estima	213	129		55	32	24	32	0	1.080	---	---
Latonia	224	135		57	36	26	34	0	1.079	---	---
Liseta	258	157		67	31	25	34	1	1.077	---	---
Mondial	169	68		29	38	20	18	1	1.071	---	---
Morene	153	97		41	36	27	34	0	1.078	---	---
Morning Gold	207	151		64	25	26	44	2	1.086	---	---
Penta	205	136		58	29	19	41	6	1.074	---	---
Premier	87	19		8	72	14	6	0	1.094	---	---
Superior (std.)	269	236		100	8	11	54	22	1.075	---	---
Waller-Duncan											
(k=100, P = 0.05)	42	42									

¹Planted March 27, harvested July 9, 1996.

²Size distribution 1 = 1.5-1.88"; 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = > 3.25."

³Determined by weight in air/weight in water method.

⁴Unreplicated samples: 1-4 = acceptable, 5 = marginal, 6 or greater = unacceptable.

Virginia Table 4. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity of red trial grown for 134 days at Painter, Virginia, 1996.

Clone ¹	Yield > 1-1/2" cwt/A	Marketable Yield		Percentage of std.	Size Distribution ² by class (%)				Specific Gravity ³
		cwt/A	Percentage of std.		1	2	3	4	
Cherry Red	311	248	92	17	17	49	14	1.065	
Dark Red Norland	315	235	87	23	28	43	4	1.056	
Fontenot	302	226	83	15	14	39	22	1.063	
Red Lasoda	217	160	59	14	13	50	10	1.053	
Red Pontiac (std.)	464	271	100	17	12	31	15	1.042	
Red Ruby	338	149	55	47	22	19	1	1.051	
B0616-1	293	192	71	29	25	36	4	1.058	
B0811-4	171	82	30	50	26	21	0	1.083	
B0811-13	341	234	86	21	16	39	13	1.068	
MN15620	248	80	30	36	19	12	0	1.050	
ND1871-3R	382	218	80	28	23	29	5	1.056	
NY97	358	248	92	20	17	39	11	1.057	
Waller-Duncan									
(k = 100, P = 0.05)	118	104							

¹Planted March 27, harvested August 8, 1996.

²Size distribution 1 = <4 oz; 2 = >4-8 oz; 3 = >8-12 oz; 4 = >12-16 oz.

³Determined by weight in air/weight in water method.

Virginia Table 5. Plant and tuber characteristics and tuber defects for round-white and red-skinned clones grown at Painter, Virginia, 1996.

Clone	Vine ¹		Tuber				Tuber Defects ²					Heat Necrosis	
	Size	Maturity	Air Pollu- tion	Shape	Appear.	Skinn Matur.	Eye Depth	Heat Sprouts	Sun- burn	Second Growth	Growth Crack	# of Tubers	Rating
Advanced Round-White Trial													
Atlantic	6	6	9	2	7	5	5	9	9	9	9	4	6
Superior	8	5	9	4	8	8	6	8	9	7	9	0	9
AF1658-5	9	7	8	2	5	5	6	9	9	6	6	0	9
AF1763-2	7	4	6	3	7	7	8	9	9	7	9	0	9
AF1764-6	6	5	8	4	6	6	7	9	9	8	8	0	9
AF1764-9	9	6	8	4	5	5	6	9	9	9	8	0	9
AF1774-14	9	7	9	3	5	6	5	9	8	9	9	0	9
AF1774-15	7	6	8	3	6	7	5	9	9	6	7	3	8
AF1777-2	8	7	9	2	6	4	7	9	9	6	7	0	9
AFSC8801-2	8	5	8	4	7	4	8	9	9	6	8	0	9
B1027-6	6	7	9	2	7	6	8	8	9	7	9	0	9
NY101	7	7	9	2	7	5	7	9	9	8	9	0	9
NY109	7	5	8	2	8	6	8	9	8	9	9	3	8
Chip Trial													
Asterix	8	8	8	5	4	6	8	9	9	9	9	0	9
Atlantic	9	7	8	2	8	5	6	9	9	9	9	5	7
Sierra	6	9	9	3	5	6	8	9	9	8	9	0	9
Superior	8	6	9	3	8	8	6	9	7	9	9	0	9
AF1753-1	9	6	8	4	6	4	8	7	9	5	9	2	8

Virginia Table 5. (continued)

Clone	Vine ¹			Tuber				Tuber Defects ²					Heat Necrosis	
	Size	Maturity	Air Pollu- tion	Shape	Appear.	Skinn	Eye	Heat Sprouts	Sun- burn	Second Growth	Growth	Crack	# of Tubers	Rating
AF1756-6	6	5	7	6	4	5	8	9	9	8	9	9	0	9
B0856-4	7	6	9	2	7	6	8	9	7	9	9	9	0	9
B0171-20	9	6	9	4	5	6	8	9	7	8	9	9	0	9
B0172-21	6	6	8	3	6	3	8	9	9	8	9	9	0	9
B1078-34	8	9	9	2	7	5	8	9	9	8	9	9	0	9
B1081-4	8	5	9	3	5	5	8	9	9	6	9	9	4	7
B1088-37	8	4	9	2	5	6	4	9	7	7	5	0	0	9
B1157-5	7	2	8	4	7	7	8	9	8	9	6	0	0	9
NY112	9	8	9	3	7	4	6	8	9	9	9	0	0	9
NY113	5	6	6	2	7	6	7	9	8	9	9	3	3	7
NY114	8	6	9	2	8	6	5	7	9	9	9	0	0	9
NY115	9	7	9	2	7	6	8	9	9	5	9	1	1	7
Commercial														
Adora	7	3	5	4	6	6	7	3	9	9	5	0	0	9
Aminca	8	6	5	4	3	5	6	2	5	4	9	0	0	9
Atlantic	7	7	6	3	4	4	6	9	7	9	6	1	1	7
Bettina	7	9	9	3	3	3	8	7	9	9	9	0	0	9
Bintge	8	7	8	4	5	5	7	4	9	2	5	0	0	9
Carlingford	3	9	8	3	2	5	8	6	9	6	9	0	0	9

Virginia Table 5. (continued)

Clone	Vine ¹			Tuber				Tuber Defects ²					Heat Necrosis	
	Size	Maturity	Air Pollu- tion	Shape	Appear.	Skinn Matur.	Eye Depth	Heat Sprouts	Sun- burn	Second Growth	Growth Crack	Tubers # of	Heat Necrosis	Rating
Dali	3	8	7	4	2	2	5	6	9	6	9	0	9	9
Disco	8	8	7	4	4	3	8	9	7	7	9	0	9	9
Drago	6	8	9	2	4	3	8	9	6	9	7	0	9	9
Erntestolz	9	8	8	3	4	6	7	9	7	7	9	0	9	9
Estima	3	9	8	4	4	3	7	7	7	5	9	0	9	9
Latonia	6	8	9	4	5	3	7	5	7	9	5	0	9	9
Liseta	5	7	8	6	5	4	7	5	7	6	9	0	9	9
Mondial	8	8	9	3	2	3	7	2	9	4	9	0	9	9
Morene	4	8	9	4	6	6	7	5	9	9	9	0	9	9
Morning Gold	7	8	8	3	6	5	5	7	6	7	9	0	9	9
Penta	6	7	9	3	6	5	7	6	6	7	7	0	9	9
Premier	7	7	8	2	4	4	7	6	7	6	7	0	9	9
Superior	6	5	8	3	6	7	7	9	9	5	9	0	9	9
Red-skinned Trial														
Cherry Red	9	6	8	3	7	8	7	7	9	9	9	0	9	9
Dk. Red Norland	7	2	5	3	6	8	6	9	7	9	7	0	9	9
Fontenot	9	5	7	3	6	7	7	7	7	6	6	0	9	9
Red Lasoda	9	6	8	3	6	7	5	9	7	5	9	0	9	9
Red Pontiac	9	5	8	3	6	7	6	7	9	4	9	0	9	9

Virginia Table 5. (continued)

Clone	Vine ¹			Tuber				Tuber Defects ²					Heat Necrosis	
	Size	Maturity	Air Pollu- tion	Shape	Appear.	Skin	Eye	Heat Sprouts	Sun- burn	Second Growth	Growth	Crack	# of Tubers	Rating
Red Ruby	9	6	8	4	5	8	7	9	7	5	7	7	0	9
B0616-1	8	5	6	2	6	8	6	9	7	9	9	9	0	9
B-811-13	8	5	8	2	7	8	7	9	7	9	9	9	0	9
MN15620	8	7	9	4	2	6	7	7	7	2	9	9	0	9
ND1871-3R	7	6	9	2	8	8	6	6	6	4	9	9	0	9
NY97	7	8	8	4	6	7	8	9	8	7	9	9	0	9

¹Vine size and maturity ratings taken 76 days after planting; vine maturity ratings taken 98 days after planting.²Twenty tubers sampled.

Virginia Table 6. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity of Superior and Snowden transgenic clones grown for 102 days at Painter, Virginia, 1996.

Clone	Yield >1-1/2"	Marketable Yield		Percentage of std.	Size Distribution ¹ by class (%)				Specific Gravity ²	Average Tuber Wt. (g/tuber)		
		cwt/A	cwt/A		1	2	3	4		Total	Marketable	
Superior												
SPO2-05	208	66	33		21	10	15	5	1.055	114	151	
SP15-17	276	188	94		10	9	38	22	1.063	162	195	
SP15-24	246	170	85		10	11	40	19	1.061	141	162	
SP15-29	256	209	105		11	12	45	24	1.064	154	183	
Superior (std.)	267	200	100		9	9	34	32	1.060	166	206	
Waller-Duncan (P = 0.05)	30	24	--		--	--	--	--	0.002	28	28	
Multi variate ANOVA:												
					Wilks' Lambda P = 0.01 Pillai's Trace P = 0.01							
Snowden												
SN15-02	284	254	93		10	12	46	32	1.064	163	207	
SN15-24	289	249	91		13	14	52	21	1.064	139	179	
SN15-25	297	264	96		11	10	48	30	1.064	145	180	
SN15-40	281	240	88		14	14	44	27	1.068	138	180	
SN15-173	275	238	87		13	14	44	29	1.064	133	171	
Snowden (std.)	304	274	100		9	10	42	38	1.069	161	195	
Waller-Duncan (P = 0.05)	29	17	--		--	--	--	--	.004	28	NS	
Multi variate ANOVA:												
					Wilks' Lambda P = 0.01 Pillai's Trace P = 0.01							

¹Size Distribution: 1 = 1.5-1.88", 2 = 1.88-2.5", 3 = 2.5-3.25", 4 = >3.25".

²Determined by weight in air/weight in water method.

Virginia Table 7. Plant and tuber characteristics and tuber defects for Superior and Snowden transgenic clones grown at Painter, Virginia, 1996.

Clone	Tuber Characteristics ¹							Tuber Defects ²			
	Shape	Size	Set	Uniformity	Appear.	Skin		Sunburn	Second Growth	Heat Necrosis	
						Maturity	Sprouts			% of Tubers	Rating
SP02-05	3.6	5.0	5.4	4.6	4.1	7.1	7.4	8.9	4.1	0	9.00
SP15-17	4.0	6.4	6.7	6.3	6.1	8.0	8.1	8.3	6.3	1	8.99
SP15-24	3.6	6.0	6.4	6.0	5.9	7.9	7.6	8.7	6.4	0	9.00
SP15-29	4.0	6.0	6.0	6.3	7.0	7.9	8.6	8.1	7.1	0	9.00
Superior	3.9	6.7	6.1	5.6	6.1	8.0	8.9	8.0	6.3	0	9.00
Waller-Duncan (P = 0.05)	NS	0.8	1.1	0.9	0.8	0.5	1.0	0.9	0.8	NS	NS
SN15-02	2.1	6.5	7.8	6.6	6.6	Snowden		9.0	8.1	0	9.00
SN15-24	2.1	6.0	7.4	7.1	6.8	6.9	6.4	9.0	8.1	0	9.00
SN15-25	2.9	6.9	7.6	6.5	6.6	6.3	6.9	9.0	8.8	0	9.00
SN15-40	2.1	6.3	7.5	6.8	6.8	6.5	8.8	9.0	8.4	0	9.00
SN15-173	2.3	6.6	7.6	6.6	6.4	6.0	6.5	9.0	8.3	0	9.00
Snowden	2.1	7.3	7.8	6.5	6.8	6.5	9.0	9.0	8.6	0	9.00
Waller-Duncan (P - 0.05)	0.3	0.9	NS	NS	NS	0.7	NS	NS	NS	NS	NS

¹Visual observations. Shape: 1 = very round, 9 = very long. Other variables: 1 = very poor, 9 = exceptional.

²Visual rating of sprouts, sunburn, second growth: 1 = excessive, 9 = no defects. Heat necrosis evaluations based on 20 tubers per rep.

Wisconsin Potato Variety Trials

Jiming Jiang, Horia Groza,
Bryan Bowen¹

Evaluations of advanced selections are done within the breeding program in the fifth and sixth field generations in replicated trials at two locations and seventh and eighth field generations in the North Central Trials.

Field trials were conducted in Rhinelander and Hancock, on sandy soil under irrigation. They were planted in a randomized block design with single row plots of 20 hills/plot and 12 inch spacing within the row, and 36 inch spacing between rows. Planting, vine killing and harvest dates in Rhinelander were May 14, August 20, and August 26, respectively and in Hancock were April 20, September 3, and September 24, respectively. The North Central Trial was conducted in Hancock under exactly the same conditions and dates as the previously mentioned Hancock trials.

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Groza is an Assistant Superintendent, University of Wisconsin - Madison, Rhinelander Agricultural Research Station, 4181 Camp Bryn Afon Rd, Rhinelander, WI 54501.

Yield was graded into A size (>1 7/8" diameter), B size (<1 7/8") and culls. The vigor at second blooming, early blight at the beginning of August and vine maturity were scored on a 1-9 scale for the advanced selection trials and on a 1-5 scale for North Central Trial (1 = very weak, very susceptible or very early, respectively). Scab on tubers was scored on a 1-9 scale for the advanced selection trials (1 = very susceptible) and in a dual system for the North Central Trial (area: T = <1%; 1 = 1-20%; 2 = 21-40%; type: 1 = small, superficial; 2 = larger, superficial; 3 = larger, rough pustules; 4 = larger pustules, shallow holes; 5 = very large pustules, deep holes). The vine type was scored from 1 to 5, where 1 is stem type, 5 is leaf type. Specific gravity was determined by the weight in air and water method and the table values are expressed as (SG - 1) x 1000. The chip color was scored from 1 to 10, according to the PCII Color Chart (where 1 is the lightest and 4 is the maximum accepted), for the frying time

interval until "the bubbling" stops (which measures the reducing sugars factor and eliminates the solids factor). The chip color for the advanced trials was determined at reversion (a month storage at 55F) and after three month storage at 40F with and without reconditioning (two weeks at 65F). Data after 6 month storage at 40F from 1995 are presented. The chip color for the North Central Trial was assessed on tubers freshly harvested.

Experimental Line Characteristics

W 629 (Wischip) - medium-early, smooth, round-oval tubers, medium solids, good chip color after reconditioning from 6 month 40F storage.

W 845 (Wischip x Lenape) - medium-late, resistant to early blight, very attractive round tubers, good solids, excellent chip color at reversion and after 3 and 6 month 40F storage (directly or reconditioned), potential storage tuber rot problems.

W 870 (Wischip x Lenape) - medium-late, oval, flat tubers, good solids, good chip color at reversion and after 6 month 40F storage, occasional skinning and hollow heart.

W 921 - late, attractive round-oval tubers, low solids, good chip color at reversion and after 6 month 40F storage.

W 1100 R - medium-early (10 days later than Dark Red Norland), attractive red tubers, uniform round, good and stable color.

W 1151 rus - medium-early (10 days later than Russet Norkotah), less vigorous haulm, medium susceptibility to early blight (significantly more resistant than Russet Norkotah), fairly resistant to scab, very attractive, blocky, medium, heavy netted tubers (Norkotah type), early tuber set, sensitive to hollow heart.

W 1242 - medium-early (earlier than Snowden in Rhinelander), medium vigorous haulm, fairly resistant to early blight and scab, good yield, good solids, very good chip color (superior to Snowden) at reversion, after 3 and 6 month 40F storage (directly or reconditioned); high proportion of hollow heart as a weakness.

W 1313 - medium-late, vigorous haulm, fairly resistant to early blight, uniform round-oval tubers, medium susceptibility to pitted scab, excellent solids, good chip color at reversion and after 3

month 40F storage, especially under stress inducing sandy soils.

W 8475 R - medium-late, high set (up to 25 tubers/hill), high proportion of B size, good red color, round tubers, excellent for special market ("steamers" and "creamers").

MN 16180 - medium-late to late, vigorous haulm, medium susceptibility to early blight, resistant to scab, good solids, good chip color, very attractive round tubers, high set, medium small size, greening, the best in the North Central Trial.

MN 16489 - medium-late to late, vigorous haulm, medium susceptibility to early blight, resistant to scab, medium solids, good chip color, round oval tubers, greening.

MSB 007-1 - medium-late, vigorous haulm, medium resistance to early blight, medium susceptibility to scab (pitted type), oval tubers, very few external and internal defects, medium solids, not acceptable chip color.

MSB 076-2 - late, very vigorous haulm, medium resistance to early blight, medium resistance to scab (pitted type), hard vine killing, very good skin set,

excellent solids, good chip color.

MSB 106-7 - medium-early, medium vigorous haulm, medium resistance to early blight, fairly resistant to scab, attractive blocky tubers, medium solids, not acceptable chip color when processed after harvest.

ND 2225-1 R - medium-early to early, medium vigorous haulm, medium susceptibility to early blight, slightly susceptible to pitted scab, excellent red color, very attractive tubers, very few external and internal defects.

ND 2676-10 - early, less vigorous haulm, susceptible to early blight, medium resistance to scab, tend to have pointed end tubers, medium solids, good chip color.

Standard Variety Characteristics

Atlantic - medium-late to late, fairly resistant to early blight, very good yield, high proportion of hollow heart, high solids, good chip color at harvest but not good at reversion and after 40F storage.

Snowden - medium-early, medium resistance to early blight,

good solids, excellent chip color at reversion, after 3 and 6 month 40F storage (when reconditioned), smaller tuber size, shallow to medium shallow eyes, occasional growth cracks.

Norchip - early, medium resistance to early blight, very resistant to scab, growth cracks and offshape tubers, very tolerant to internal defects, good solids, good chip color.

Red Pontiac - late, fairly resistant to early blight, pale red color, big size tubers, growth cracks, many internal defects.

Dark Red Norland - early, susceptible to early blight, good red color which sometimes fades in the hot sandy soils of Hancock, extremely good yield.

Russet Norkotah - medium-early, very susceptible to early blight and early dying, medium susceptibility to scab, medium heavy net.

Russet Burbank - late, vigorous vines, fairly resistant to early blight and scab, light net, high proportion of knobby tubers, good solids, not a good fry color.

Wisconsin Table 1. Advanced Selection Trial 1, Rhinelander, 1996
(98 days).^z

Cultivar	Cwt/A		Vines			Tubers			Internal Def. %		
	Tot	A's	VMt	Vig	EBt	Scb	Rot	Skg	HH	VD	IBS
Atlantic	318	290	4.7	5.3	7.3	9.0	9.0	8.0	47	00	00
DRNorland	306	267	2.0	4.0	2.7	9.0	8.0	7.7	27	00	00
Goldrush	280	224	4.7	4.7	5.3	9.0	9.0	6.3	00	00	00
RNorkotah	279	210	3.7	4.7	5.3	8.7	9.0	7.7	13	07	00
Snowden	301	267	5.7	5.3	8.0	8.0	9.0	7.0	00	10	00
Superior	242	221	3.3	4.7	4.7	9.0	9.0	9.0	13	07	07
W 1100 R	361	298	3.3	4.7	5.3	8.3	8.3	7.0	00	13	00
W 1101 R	294	243	5.7	5.7	7.3	7.7	8.3	5.0	07	33	00
W 1143 R	211	164	4.3	4.0	5.0	9.0	9.0	5.7	13	33	00
W 1148 R	337	301	6.0	5.3	8.3	8.3	7.7	7.0	00	07	00
W 1189	220	191	7.0	5.0	8.3	8.7	9.0	5.0	13	00	00
W 1201	299	265	6.3	6.0	8.3	9.0	9.0	8.0	47	00	00
W 1202	226	197	5.0	5.0	5.7	9.0	9.0	6.7	13	07	00
W 1220	295	269	5.0	4.3	7.7	8.0	9.0	6.3	53	00	00
W 1242	269	234	4.3	5.0	6.7	9.0	9.0	6.0	40	00	00
W 1267 R	274	224	7.0	6.7	8.7	8.7	7.7	5.3	00	00	00
W 1280 R	321	291	3.7	4.7	5.7	8.7	9.0	7.0	07	00	07
W 1290	233	205	5.3	5.7	7.7	8.7	9.0	4.3	13	20	00
W 1301	248	238	5.7	6.3	8.7	8.3	9.0	6.0	53	00	00
W 1302	239	197	6.7	6.7	8.0	8.7	9.0	4.0	47	00	00
W 1313	315	295	6.0	6.7	7.7	8.7	9.0	4.7	47	00	00
W 1325	271	246	5.2	6.3	8.3	8.0	9.0	6.7	47	00	07
W 1328	274	244	4.3	5.7	7.7	8.7	9.0	6.0	00	00	00
W 1329	361	328	6.3	6.3	8.0	9.0	9.0	5.3	20	00	00
W 1332	293	258	5.3	4.3	6.0	7.3	8.0	7.0	67	00	00
W 1335	216	171	5.0	5.3	6.3	9.0	8.3	6.7	07	00	00
W 1336	297	259	4.7	5.0	7.0	9.0	9.0	7.0	73	00	00
W 1339	335	322	5.7	5.7	8.3	8.3	9.0	6.7	40	00	00
W 1341	283	245	4.0	5.0	6.0	7.7	9.0	8.0	20	00	07
W 1342	258	209	4.3	4.3	6.0	9.0	9.0	8.0	00	00	13
W 629	293	254	4.3	4.0	6.3	8.3	9.0	7.3	00	13	00
W 84-75 R	254	084*	6.0	3.3	6.3	8.7	9.0	6.7	00	07	00
W 845	350	305	5.3	5.0	8.0	8.7	9.0	6.0	27	07	00
W 870	250	207	5.3	5.3	7.7	8.7	8.7	5.7	13	00	00
W 921	211	184	6.7	5.7	8.7	9.0	9.0	4.3	13	00	00
Average	281	240	5.1	5.2	6.9	8.6	8.8	6.4	22	05	01

* 169 Cwt/A of B's

^z**Tot** = Total yield, **A's** = A (>1"7/8 tubers) yield; **VMt**: Vine maturity (1=early, 9=late); **Vig**: Vine vigor (1=weak, 9=vigorous); **EBt**: Early blight (1=very attacked, 9=no attack); **Scb**: Scab (1=very attacked, 9=no attack); **Rot**: Tuber dry rot (1=very attacked, 9=no attack); **Skg**: Skinning (1=very skinned; 9 = no skinning); **HH**=Hollow heart; **VD**=Vascular discoloration; **IBS**=Internal Brown Spot.

Wisconsin Table 2. Advanced Selection Trial 1, Rhinelander, 1996
(98 days).^z

Cultivar	SpGv	Chip Color				
		Rev	3mD	3mR	6mD	6mR*
Atlantic	78.8	3.1	6.4	6.7	5.8	3.1
Goldrush	68.6	3.7	10.0	9.1	7.0	4.5
Russet Norkotah	68.1	4.8	9.6	9.3	9.3	6.0
Snowden	78.1	2.8	6.3	3.8	4.0	2.5
Superior	71.7	2.8	7.2	7.3	4.0	1.8
W 1189	69.6	2.5	5.8	5.8	3.5	2.9
W 1201	75.6	3.3	9.3	8.8	7.0	4.0
W 1202	69.6	2.7	7.3	7.3	6.0	3.8
W 1220	72.4	2.6	5.1	4.8	2.8	3.0
W 1242	73.8	1.9	4.4	4.6	2.6	2.9
W 1290	77.6	3.3	6.1	5.3	2.5	3.0
W 1301	77.4	3.0	6.2	6.9	3.6	3.5
W 1302	79.6	3.4	8.3	9.3	7.5	3.1
W 1313	82.5	2.8	5.3	4.3	4.4	2.9
W 1325	78.9	3.3	6.4	8.8	5.8	4.3
W 1328	76.8	3.0	7.8	6.1	6.3	4.5
W 1329	64.4	3.0	5.8	7.1	3.5	3.0
W 1332	71.5	2.6	9.7	6.7	4.9	3.1
W 1335	80.6	3.0	8.7	8.2	7.8	5.0
W 1336	74.1	2.8	5.1	6.4	3.6	3.5
W 1339	73.7	3.3	9.7	6.8	6.3	3.9
W 1341	82.7	2.9	8.2	7.0	4.8	4.5
W 1342	72.1	3.2	10.0	9.0	6.5	4.6
W 629	76.1	3.3	10.0	8.7	7.0	3.3
W 845	81.7	3.0	5.4	5.6	4.1	2.5
W 870	86.7	2.8	7.3	7.7	4.8	3.1
W 921	65.5	2.6	5.2	5.4	4.1	2.8
Average	72.5	3.0	7.3	6.9	-	-

* Results from 1995 trial; the 6 month storage data from 1996 trial are not available at the date of publication.

^zSpGrav: (Specific Gravity -1) x 1000;

Chip Color (CPII scale, where 1=light,10=dark): Rev = Reversion, 3m = 3 month storage at 40F, 6m = 6 month storage at 40F (D=direct, R=reconditioned 14 days at 65F).

Wisconsin Table 3. Advanced Selection Trial 2, Rhinelander, 1996
(98 days).²

Cultivar	Cwt/A		Vines			Tubers			Internal Def.		
	Tot	A's	VMt	Vig	EBt	Scb	Rot	Skg	HH	VD	IBS
Atlantic	341	311	5.0	5.0	7.0	8.7	9.0	8.3	73	00	13
DRNorland	389	347	3.0	3.3	3.0	8.7	9.0	8.0	33	07	00
Goldrush	319	270	5.0	5.0	5.7	9.0	8.7	7.0	00	00	00
RNorkotah	333	260	4.0	4.7	5.0	8.7	9.0	7.0	07	00	00
Snowden	333	302	5.0	5.7	6.3	9.0	8.3	7.3	00	00	00
Superior	274	262	4.0	4.7	4.7	9.0	9.0	9.0	00	00	00
W 1005rus	291	203	5.3	6.0	6.3	9.0	9.0	7.3	00	00	00
W 1099rus	300	233	4.7	5.0	7.7	9.0	9.0	9.0	00	00	00
W 1151rus	256	213	5.5	5.0	7.7	9.0	8.7	7.3	40	00	00
W 1201	340	321	5.3	5.7	7.3	8.7	8.7	7.7	20	07	00
W 1202	301	278	5.2	5.0	6.0	9.0	9.0	7.3	20	00	00
W 1348rus	314	206	6.3	6.3	7.3	9.0	9.0	7.3	00	00	00
W 1350	223	121	2.0	3.7	2.3	9.0	9.0	8.7	13	00	00
W 1351	175	128	7.3	7.0	9.0	8.3	9.0	5.3	53	00	00
W 1353	199	170	5.7	6.0	8.0	8.7	7.3	5.0	00	00	00
W 1354	273	208	6.3	6.3	7.3	8.7	9.0	5.3	07	00	00
W 1355-1	346	275	4.7	6.0	6.7	9.0	8.7	7.7	00	00	00
W 1355-2	291	255	6.0	5.7	7.3	8.7	9.0	5.0	73	00	07
W 1359	283	241	5.3	5.0	7.3	9.0	9.0	6.0	80	00	00
W 1360	279	256	3.7	4.0	5.0	8.0	9.0	8.3	47	00	00
W 1368	335	275	4.7	5.3	7.7	8.0	9.0	5.0	40	00	00
W 1371	231	205	5.0	4.0	6.7	8.3	9.0	7.0	00	00	13
W 1374	336	318	4.3	5.0	6.7	9.0	9.0	7.0	00	00	00
W 1375	317	292	5.3	5.0	8.3	8.7	9.0	5.0	27	00	00
W 1382	184	133	4.0	4.0	5.0	8.7	8.7	3.3	00	00	00
W 1386	378	354	5.0	5.3	7.3	8.3	8.7	5.7	13	00	00
W 1390	270	239	5.3	5.0	8.0	8.0	8.0	5.3	07	00	07
W 1407	328	308	5.7	5.0	7.7	8.3	8.3	4.7	33	00	00
W 1421	280	259	6.2	5.0	8.7	9.0	9.0	7.7	00	00	00
W 1431	282	261	5.5	5.0	7.0	8.0	8.7	3.3	20	00	00
W 1443	354	313	5.2	5.7	7.3	8.7	9.0	6.7	40	00	00
W 1455	278	237	4.7	5.3	7.3	8.3	9.0	8.0	73	00	07
W 1456	246	221	5.2	5.3	8.3	9.0	9.0	5.0	47	00	00
W 1474	206	185	5.0	4.7	7.3	8.3	8.3	7.3	20	00	00
W 1492	366	332	4.0	4.3	7.7	8.3	8.7	7.3	00	00	00
Average	293	251	5.0	5.1	6.8	8.7	8.8	6.6	22	00	01

²**Tot** = Total yield, **A's** = A (>1"7/8 tubers) yield; **VMt**: Vine maturity (1=early, 9=late); **Vig**: Vine vigor (1=weak, 9=vigorous); **EBt**: Early blight (1=very attacked, 9=no attack); **Scb**: Scab (1=very attacked, 9=no attack); **Rot**: Tuber dry rot (1=very attacked, 9=no attack); **Skg**: Skinning (1=very skinned; 9 = no skinning); **HH**=Hollow heart; **VD**=Vascular discoloration; **IBS**=Internal Brown Spot.

Wisconsin Table 4. Advanced Selection Trial 2, Rhinelander, 1996
(98 days).²

Cultivar	SpGv	Chip Color				
		Rev	3mD	3mR	6mD	6mR*
Atlantic	79.2	2.9	7.2	6.3	5.8	3.1
Goldrush	66.2	5.7	10.0	9.0	7.0	4.5
Russet Norkotah	64.9	5.9	10.0	8.7	9.3	6.0
Snowden	75.8	2.4	6.7	6.1	4.0	2.5
Superior	70.1	3.3	8.0	7.2	4.0	1.8
W 1005 rus	74.2	3.8	7.9	6.7	4.0	3.5
W 1099 rus	64.6	3.7	9.7	10.0	7.5	7.5
W 1151 rus	58.5	6.0	9.7	10.0	7.8	4.6
W 1201	74.5	2.5	7.8	7.4	7.0	4.0
W 1202	72.1	2.9	7.7	6.8	6.0	3.8
W 1348 rus	68.9	3.2	6.2	8.7	6.3	4.0
W 1350	82.1	1.5	7.7	5.8	10.0	3.0
W 1351	78.2	2.5	5.4	6.0	5.0	3.5
W 1353	71.9	2.8	8.8	8.2	3.3	3.3
W 1354	80.6	3.0	5.6	5.2	3.5	3.0
W 1355-1	78.9	1.5	3.8	3.1	2.5	2.5
W 1355-2	64.8	3.0	7.1	5.8	3.3	3.0
W 1359	80.2	2.5	6.3	6.0	6.0	5.0
W 1360	78.4	2.7	5.0	5.6	8.5	4.5
W 1368	72.6	3.2	6.6	7.0	8.0	5.0
W 1371	75.4	2.5	6.6	5.8	7.0	3.5
W 1374	78.2	2.3	6.8	6.9	5.0	5.0
W 1375	73.5	2.7	5.3	7.2	7.0	3.0
W 1382	83.1	-	7.0	5.7	4.5	3.0
W 1386	71.1	2.8	6.7	7.0	4.8	4.5
W 1390	72.6	2.2	6.9	4.8	6.0	6.0
W 1407	71.8	4.1	8.1	8.7	9.0	6.0
W 1421	72.5	2.5	8.2	6.7	6.0	3.5
W 1431	72.4	2.9	5.2	5.9	4.3	3.5
W 1443	68.6	2.4	6.0	4.1	7.0	4.0
W 1455	81.3	3.0	7.9	4.8	6.5	4.8
W 1456	80.8	2.7	7.9	7.0	3.0	3.0
W 1474	77.9	3.0	5.6	6.3	4.3	5.5
W 1492	72.4	2.3	5.1	4.4	3.8	3.0
Average	73.4	3.0	7.1	6.6	-	-

* Results from 1995 trial; the 6 month storage data from 1996 trial are not available at the date of publication.

²SpGrav: (Specific Gravity -1) x 1000;

Chip Color (CPII scale, where 1=light,10=dark): **Rev** = Reversion, **3m** = 3 month storage at 40F, **6m** = 6 month storage at 40F (**D**=direct, **R**=reconditioned 14 days at 65F).

**Wisconsin Table 5. Advanced Selection Trial 1, Hancock, 1996
(133 days).²**

Cultivar	Cwt/A		Vines			Tubers		Internal Def.		
	Tot	A's	VMt	Vig	EBt	Scb	GCK	HH	VD	IBS
Atlantic	429	394	5.0	5.3	7.3	7.7	8.7	67	13	07
DRNorland	420	381	2.7	3.7	2.0	9.0	9.0	10	00	00
Goldrush	355	319	4.3	5.3	5.7	9.0	9.0	07	07	00
RNorkotah	309	254	4.0	4.7	3.3	7.7	9.0	20	27	00
Snowden	435	411	5.7	6.3	5.3	8.7	9.0	27	13	00
Superior	330	306	1.7	3.3	0.3	8.3	9.0	00	27	07
W 1100 R	396	342	3.0	4.7	2.7	8.3	9.0	00	00	00
W 1101 R	304	278	6.3	6.3	6.0	6.0	7.7	00	33	00
W 1143 R	284	248	3.0	4.7	5.0	8.3	8.3	00	00	00
W 1148 R	472	444	6.3	6.7	6.7	8.3	9.0	00	13	00
W 1189	493	462	7.0	6.7	7.3	8.0	9.0	53	33	40
W 1220	434	407	5.7	5.3	7.0	5.3	8.3	80	00	00
W 1221	325	306	3.7	4.3	4.0	8.0	9.0	67	00	00
W 1242	516	480	5.0	5.3	6.7	8.3	9.0	73	00	00
W 1267 R	428	384	6.3	6.3	7.0	8.0	9.0	07	13	00
W 1280 R	328	288	3.3	3.7	2.3	7.7	8.7	00	00	00
W 1290	382	356	5.0	6.0	5.3	8.0	9.0	13	00	20
W 1301	424	408	5.5	5.0	7.3	8.0	9.0	13	00	40
W 1302	577	531	6.7	6.7	7.7	6.3	8.3	20	07	00
W 1313	485	441	6.3	7.3	7.3	5.3	9.0	13	00	53
W 1317	262	241	5.3	5.7	7.0	8.7	9.0	50	20	00
W 1322	491	449	4.3	6.0	6.7	5.0	7.7	33	13	07
W 1325	413	394	5.5	6.3	8.0	4.7	7.7	33	00	07
W 1328	302	275	4.3	5.7	6.0	9.0	9.0	00	20	00
W 1329	346	313	5.7	6.0	6.7	9.0	9.0	00	00	13
W 1332	416	398	5.5	5.0	7.0	7.7	8.7	60	33	00
W 1335	476	421	4.7	6.0	6.0	8.0	8.7	20	00	00
W 1336	450	412	5.3	6.0	6.3	8.0	8.3	53	00	00
W 1339	537	506	5.7	6.7	7.0	7.3	8.3	33	07	07
W 1341	315	273	4.7	4.7	5.0	8.0	9.0	00	00	20
W 1342	450	367	4.0	5.3	2.7	8.7	9.0	00	00	30
W 1349	359	279	4.7	5.0	3.0	5.7	8.7	40	00	07
W 84-75 R	176	084*	2.0	2.7	0.7	9.0	9.0	00	33	00
W 870	331	305	4.7	5.0	6.0	8.0	9.0	27	07	00
Average	396	357	4.8	5.4	5.4	7.7	8.7	24	09	07

* 89 Cwt/A of B's

²**Tot** = Total yield, **A's** = A (>1"7/8 tubers) yield; **VMt**: Vine maturity (1=early, 9=late); **Vig**: Vine vigor (1=weak, 9=vigorous); **EBt**: Early blight (1=very attacked, 9=no attack); **Scb**: Scab (1=very attacked, 9=no attack); **GCK**: Tuber growth cracks (1=very cracked, 9=no cracks); **HH**=Hollow heart; **VD**= Vascular discoloration; **IBS**=Internal Brown Spot.

Wisconsin Table 6. Advanced Selection Trial 1, Hancock, 1996
(133 days).^z

Cultivar	SpGv	Chip Color				
		Rev	3mD	3mR	6mD	6mR*
Atlantic	92.2	3.3	9.9	5.2	10.0	6.0
Goldrush	71.9	5.3	10.0	7.8	-	-
Russet Norkotah	68.3	5.8	10.0	8.0	-	-
Snowden	81.9	3.1	10.0	4.1	8.0	4.7
Superior	66.9	5.0	10.0	5.9	9.0	5.0
W 1189	81.9	3.4	10.0	3.3	7.5	4.2
W 1220	86.6	3.1	9.1	4.0	8.0	5.5
W 1221	82.7	3.1	9.5	4.8	8.0	6.0
W 1242	87.6	3.0	7.6	3.3	6.5	4.0
W 1290	86.5	3.1	9.3	4.6	10.0	8.0
W 1301	84.6	3.3	9.7	6.1	8.0	4.5
W 1302	97.9	3.8	10.0	7.6	10.0	6.0
W 1313	93.6	3.0	6.8	5.1	10.0	6.5
W 1317	90.0	3.1	8.7	4.2	9.0	6.5
W 1322	76.6	3.8	10.0	6.2	9.0	7.0
W 1325	97.9	3.7	10.0	5.7	8.0	10.0
W 1328	90.8	3.1	9.3	4.6	9.0	7.0
W 1329	84.6	3.0	7.9	4.9	8.5	5.5
W 1332	81.1	3.1	10.0	4.6	9.5	5.0
W 1335	97.9	3.5	9.7	6.1	10.0	7.5
W 1336	86.6	2.8	8.3	4.7	10.0	7.0
W 1339	91.1	4.3	10.0	8.0	8.5	8.0
W 1341	87.8	2.8	10.0	5.6	9.0	7.0
W 1342	78.7	3.4	10.0	6.7	10.0	6.0
W 1349	82.7	2.4	9.7	3.9	8.0	7.0
W 870	90.7	3.8	9.8	5.7	8.0	5.5
Average	81.2	2.7	9.4	5.4	-	-

* Results from 1995 trial; the 6 month storage data from 1996 trial are not available at the date of publication.

^zSpGrav: (Specific Gravity -1) x 1000;

Chip Color (CPII scale, where 1=light,10=dark): **Rev** = Reversion, **3m** = 3 month storage at 40F, **6m** = 6 month storage at 40F (**D**=direct, **R**=reconditioned 14 days at 65F).

**Wisconsin Table 7. Advanced Selection Trial 2, Hancock, 1996
(133 days).^z**

Cultivar	Cwt/A		Vines			Tubers		Internal Def.		
	Tot	A's	VMt	Vig	EBt	Scb	Gck	HH	VD	IBS
Atlantic	370	346	5.3	5.7	7.0	6.7	9.0	40	13	00
DRNorland	381	344	2.3	4.5	1.3	9.0	9.0	00	00	00
Goldrush	392	359	4.3	5.0	4.0	9.0	9.0	07	07	00
RNorkotah	321	266	4.5	5.0	4.3	7.0	9.0	13	00	00
Snowden	376	356	5.0	5.7	4.3	7.7	9.0	13	13	00
Superior	285	266	2.0	4.7	1.3	9.0	9.0	27	20	07
W 1005rus	437	378	6.0	6.3	7.3	8.7	9.0	33	00	00
W 1099rus	313	269	5.0	5.0	4.7	9.0	9.0	00	07	00
W 1151rus	287	258	5.0	5.0	6.7	9.0	9.0	33	00	00
W 1201	443	420	5.3	5.3	7.0	9.0	9.0	00	27	00
W 1202	362	327	5.0	5.3	4.3	8.0	9.0	20	27	00
W 1348rus	448	394	6.7	6.7	7.3	9.0	9.0	00	00	00
W 1350	252	193	1.3	4.0	1.0	9.0	9.0	00	00	00
W 1351	446	395	7.3	8.0	9.0	5.3	9.0	33	27	00
W 1353	292	267	5.3	4.7	6.0	7.0	9.0	00	00	00
W 1354	440	386	6.3	6.0	6.7	7.0	9.0	73	20	00
W 1355-1	371	327	4.7	5.0	4.0	7.3	9.0	00	07	00
W 1355-2	518	489	6.0	6.7	6.3	8.0	9.0	87	00	07
W 1359	328	300	5.3	5.7	7.0	8.3	9.0	73	00	00
W 1360	423	388	4.7	5.0	4.0	6.7	9.0	40	00	00
W 1368	420	381	4.3	6.3	5.0	7.7	9.0	00	00	07
W 1371	404	375	5.0	5.0	7.0	7.7	9.0	07	20	07
W 1374	371	354	3.7	5.0	4.3	8.3	9.0	00	10	10
W 1375	359	346	4.7	4.7	4.3	7.8	9.0	13	00	00
W 1382	265	232	4.3	4.3	4.3	8.7	9.0	27	27	00
W 1386	411	387	4.3	7.6	5.7	6.0	9.0	13	07	00
W 1390	355	323	4.3	4.7	6.7	8.5	8.0	00	20	37
W 1407	403	382	5.3	5.7	6.0	7.7	8.7	00	07	00
W 1421	470	437	6.7	6.0	7.0	7.3	8.7	00	20	20
W 1431	422	400	5.5	4.7	5.0	8.7	9.0	20	00	00
W 1443	459	430	4.7	5.3	6.7	7.7	9.0	20	13	07
W 1455	396	357	4.3	4.7	6.3	8.7	9.0	93	00	00
W 1456	334	303	5.0	5.3	5.0	9.0	9.0	73	00	00
W 1474	316	292	4.7	5.0	5.3	6.0	9.0	20	00	00
W 1492	412	390	4.0	4.3	4.7	6.0	9.0	13	07	00
Average	379	346	4.8	5.3	5.4	7.9	9.0	23	08	03

^z**Tot** = Total yield, **A's** = A (>1"7/8 tubers) yield; **VMt**: Vine maturity (1=early, 9=late); **Vig**: Vine vigor (1=weak, 9=vigorous); **EBt**: Early blight (1=very attacked, 9=no attack); **Scb**: Scab (1=very attacked, 9=no attack); **Gck**: Tuber growth cracks (1=very cracked, 9=no cracks); **HH**=Hollow heart; **VD**=Vascular discoloration; **IBS**=Internal Brown Spot.

Wisconsin Table 8. Advanced Selection Trial 2, Hancock, 1996
(133 days).^z

Cultivar	SpGv	Chip Color				
		Rev	3mD	3mR	6mD	6mR*
Atlantic	94.1	3.4	8.4	5.4	10.0	6.0
Goldrush	71.1	4.7	10.0	7.8	-	-
Russet Norkotah	67.5	6.0	10.0	7.9	-	-
Snowden	82.3	2.9	10.0	3.7	8.0	4.7
Superior	66.9	4.7	10.0	7.9	9.0	5.0
W 1005 rus	74.2	5.1	10.0	6.8	-	-
W 1099 rus	66.7	4.9	10.0	8.8	-	-
W 1151 rus	64.5	6.7	10.0	8.0	-	-
W 1201	91.2	3.2	9.9	5.8	9.0	7.0
W 1202	76.2	3.9	9.7	6.7	10.0	8.0
W 1348 rus	78.2	4.8	9.2	7.2	-	-
W 1350	87.1	2.7	9.0	5.7	-	-
W 1351	99.1	3.1	8.7	5.6	-	-
W 1353	95.7	3.2	10.0	4.6	-	-
W 1354	88.0	3.0	7.0	4.3	-	-
W 1355-1	83.9	2.6	10.0	3.7	-	-
W 1355-2	86.0	3.1	8.7	4.3	-	-
W 1359	90.6	2.8	7.7	4.4	-	-
W 1360	81.1	3.3	9.1	6.3	-	-
W 1368	91.0	3.3	8.5	6.7	-	-
W 1371	89.4	3.5	8.2	6.6	-	-
W 1374	84.3	3.4	9.2	6.7	-	-
W 1375	91.0	3.3	10.0	7.0	-	-
W 1382	84.4	3.4	9.8	7.3	-	-
W 1386	86.6	3.3	7.9	5.7	-	-
W 1390	82.6	2.9	7.8	5.2	-	-
W 1407	87.3	3.8	10.0	7.8	-	-
W 1421	88.2	3.4	9.9	6.4	-	-
W 1431	92.1	2.8	6.9	5.7	-	-
W 1443	76.6	3.4	10.0	5.2	-	-
W 1455	89.0	3.1	10.0	6.6	-	-
W 1456	92.3	3.2	10.0	6.7	-	-
W 1474	83.8	3.7	10.0	5.3	-	-
W 1492	87.4	3.6	10.0	5.9	-	-
Average	83.1	3.7	9.3	6.2	-	-

* Results from 1995 trial; the 6 month storage data from 1996 trial are not available at the date of publication.

^zSpGrav: (Specific Gravity -1) x 1000;

Chip Color (CPII scale, where 1=light,10=dark): **Rev** = Reversion, **3m** = 3 month storage at 40F, **6m** = 6 month storage at 40F (**D**=direct, **R**=reconditioned 14 days at 65F).

**Wisconsin Table 9. North Central Regional Trial, Hancock, 1996
(133 days).^z**

Cultivar	Cwt/A		Vines			Tuber Quality			General	
	Tot	A's	Vmt	Vig	EBt	Scb	SpGrav	Chip	Merit	Rk
Atlantic	462	426	5.0	3.0	4.4	T-4	1.08761	3.6		2
Snowden	415	387	2.5	3.0	3.4	T-3	1.08345	2.9		
Norchip	343	310	1.5	2.8	3.3	0-0	1.08262	3.9		
R.Pontiac	502	439	5.0	3.5	4.0	1-4	1.06280	10.0		
DRNorland	418	391	1.0	2.3	2.2	T-1	1.06361	5.6		
RNorkotah	393	330	2.5	3.0	1.9	1-2	1.06788	5.9		3
R.Burbank	440	353	5.0	3.8	4.0	0-0	1.08451	5.8		
MN 16180	531	484	5.0	3.8	3.8	0-0	1.08720	3.5		1
MN 16489	490	434	5.0	3.8	3.8	0-0	1.07894	3.3		
MSB 007-1	471	438	4.3	3.5	4.0	1-4	1.07610	6.3		
MSB 076-2	582	522	5.0	4.3	4.4	T-3	1.09499	3.9		
MSB 106-7	558	523	3.3	3.3	3.3	T-1	1.07556	5.8		
ND2225-1R	481	430	2.5	3.0	3.0	T-3	1.06764	7.3		4
ND2676-10	398	362	1.3	2.3	2.8	T-1	1.07876	3.1		
W 1151rus	363	331	3.0	2.5	3.8	T-2	1.06110	6.7		
W 1242	457	429	2.5	3.0	4.3	T-1	1.08502	3.1		
W 1313	486	454	4.3	3.8	4.0	1-4	1.09695	3.4		5
Average	458	414	3.4	3.2	3.6	-	1.07851	4.9		-

^z**Tot** = Total yield, **A's** = A (>1"7/8 tubers) yield; **Vmt**: Vine maturity (1=early, 5=late); **Vig**: Vine vigor (1=weak, 5=vigorous); **EBt**: Early blight (1=very attacked, 5=no attack); **Scb**: Scab (Area: T=<1%; 1=1-20%; 2=21-40%; 3=41-60%; 4=61-80%; 5=80-100%; Type: 1=small, superficial; 2=larger, superficial; 3=larger, rough pustules; 4=larger pustules, shallow holes; 5=very large pustules, deep holes); **Chip**: Chip color after harvest (CPII scale: 1=light, 10=dark). **General Merit Rk**: General merit rank.

Wisconsin Table 10. North Central Regional Trial, Hancock, 1996
(133 days).^z

Cultivar	Percent External Defects					Percent Internal Defects			
	GCK	Ofs	SGn	Rot	TbsFree	HH	IBS	VD	NormTbs
Atlantic	5.0	10.5	11.7	0.0	72.8	40	8	1	60.0
Snowden	5.7	3.9	9.3	0.6	80.5	11	4	10	85.0
Norchip	10.4	12.4	6.0	1.7	69.5	3	3	6	91.0
R.Pontiac	10.5	16.2	5.1	4.9	63.2	27	5	8	64.0
DRNorland	9.0	1.0	8.0	0.0	81.9	18	1	4	82.0
RNorkotah	0.0	6.1	7.5	2.5	83.9	18	2	6	82.0
R.Burbank	0.8	54.9	1.2	5.3	37.8	20	1	2	80.0
MN 16180	0.5	1.2	14.8	0.3	83.2	7	1	2	91.0
MN 16489	0.0	12.7	14.8	0.7	71.7	8	0	4	92.0
MSB 007-1	0.0	3.8	8.5	0.8	87.0	0	0	1	99.0
MSB 076-2	4.6	7.3	3.8	0.4	83.9	8	0	2	92.0
MSB 106-7	0.0	0.8	7.0	0.3	91.9	4	4	10	85.0
ND2225-1R	1.7	5.2	3.8	0.0	89.3	0	2	7	91.0
ND2676-10	1.3	3.8	8.2	2.0	84.6	29	1	17	70.0
W 1151rus	0.0	7.1	4.6	0.8	87.5	42	1	1	58.0
W 1242	0.0	8.4	3.9	0.3	87.4	60	0	5	40.0
W 1313	1.0	8.8	7.6	2.1	80.4	4	2	21	77.0
Average	3.0	9.7	7.4	1.3	78.6	17	2	6	78.8

^z**GCK**: Tuber growth cracks (1=very cracked, 9=no cracks); **Ofs**: Offshaped tubers; **SGn**: Sun green; **Rot**: Tuber rot; **TbsFree**: Tubers free of external defects; **HH**=Hollow heart; **VD**=Vascular discoloration; **IBS**=Internal Brown Spot; **NormTbs**: Normal tubers (no internal defects).

